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THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—14TH YEAR. SYDNEY: SATURDAY, DECEMBER 10, 1927. No. 24.

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THE MEDICAL JOURNAL OF AUSTRALIA

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SOME OF THE MODERN CONCEPTIONS AND ADVANCES IN SURGERY.[1]

By H. SKIPTON STACY, M.D., Ch.M. (Sydney), F.C.S.A.,
Honorary Surgeon, Sydney Hospital.

IN speaking of advances in surgery we at once think of radiography in all its various branches; one of the latest developments being shadows of the various organs (or portion of them) after the preliminary injection of such opaque substances as sodium iodide into the renal pelvis; after ingestion by the mouth (or intravenously) of tetra-iodo-sodium-phenol-phthalein to display the gall bladder; after the intratracheal injection of "Lipiodol" to render obvious bronchiectatic cavities *et cetera* of the lung. And last development of all—the injection *per medium* of the lumbar puncture needle of air by which the topography of the brain is beautifully outlined.

These methods, though of only comparatively recent origin, are helping to make diagnosis much more exact, but they must be interpreted along with clinical signs and symptoms.

Like all other new methods they will be the subject perhaps of over-much zeal and enthusiasm at first, but there is no question they are going to help tremendously.

Lighting.

To a surgeon good light is one of the first essentials. As we look around some of our operating theatres we marvel at the way we have held on to wrong methods of illumination all these years; we too often copy another institution blindly, without thinking for ourselves. Think of an operative field. Is it not wiser to concentrate good light upon this and have the rest of the theatre just moderately lighted so as not to dazzle the eyes and contract the pupil? Yet too often we light the whole theatre brilliantly, the operative field incidentally sharing in it more or less. But thanks to the Scialytique light (a French invention) we have our field softly and brilliantly illuminated; only one lamp of one hundred candlepower is used; this is reflected from a number of mirrors placed around it in a circle; there are no shadows cast, as the name denotes, and there is very little heat.

I look upon it as one of the greatest advances in modern surgery and frequently operate under it in preference to the daylight.

The Abdomen.

Now, to come to matters more strictly surgical, we will consider first that most interesting and most elusive of all surgical localities—the abdomen.

Perhaps, as surgeons, we have been a little inclined to prescribe surgical treatment too freely for abdominal disorders, such as pain, digestive derangements *et cetera*. There is no shadow of doubt that many of these respond to surgical treatment much better than to medical; we think particularly of appendiceal and gall bladder infections, also to a less extent of gastric and duodenal ulceration. These successes have perhaps made us too confident in recommending surgical treatment, for closer investigations are teaching us that some of the pain and interference with normal functions are due to disordered action of the involuntary nervous system (sympathetic and para-sympathetic, comprising vagus and sacral nerves) resulting in spasm or in some cases achalasia, a failure to relax. These disorders are particularly apt to occur at the orifices, such as the pylorus and ileo-caecal; in some cases at the anal orifice or at the site of O'Beirne's sphincter, several inches above it. It has also been suggested that spasm of the sphincter of Oddi at Vater's papilla occasionally occurs. What the primary pathology is we are as yet ignorant, but of its effects there are many clinical manifestations, for example, congenital hypertrophic stenosis, intusssusception, ileal spasm, Hirschsprung's disease. It is suggested also by one writer, Monsarrat, of Liverpool, that the cause of gastric and duodenal ulcer probably lies in an alteration of gastric rhythm; the site of the ulceration being the site of maximum wear and tear by gastric contents whose normal neutralization has been interfered with by the altered gastric rhythm; the disturbed innervation originating in toxic, psychic or reflex influences from disease elsewhere.

Fraser, of Edinburgh, relates many cases in which spasm of the ileo-caecal region has caused the appendix to be wrongly blamed. It may be that this is the cause of that right iliac pain accompanied with other vague symptoms, not uncommon in the female. These cases have been our bugbear in the past and the patients usually bear the handmark of several surgeons or of one surgeon many times over. The condition is often accompanied by an undue mobility of the caecum and ascending colon. Probably the real underlying cause is an unstable nervous system, affecting both cerebro-spinal and involuntary.

Gastric and Duodenal Ulcer.

The pain in gastric and duodenal ulcer was formerly thought to be due to the acid contents passing over the raw area, but as Hurst has shown experimentally, dilute hydrochloric acid may be poured over an ulcer without giving rise to pain. For some years now the cause of the pain has been shown to be due to excessive contraction of various parts of the stomach musculature.

According to Rogers and Handt, as quoted by Monsarrat in *The British Medical Journal*, the normal stomach exhibits: (i) A tonic grasp with rhythmical variations of the upper stomach musculature upon the food, (ii) peristaltic contractions of the *antrum pylori*, (iii) peristaltic contractions, hunger contractions, of the entire stomach.

In disease it is these variations from normal gastric mobility which in the form of muscular spasm lead to gastric pain.

Influences which may interfere with the normal course of gastric rhythm, are: (i) Psychic, such as grief, excitement *et cetera*, (ii) toxic, such as nicotine and bacteria, (iii) reflex, such as disease elsewhere, particularly in the abdomen; the appendix and gall bladder are the chief offenders.

[1] A British Medical Association lecture delivered at a meeting of the Northern Districts Medical Association, New South Wales on September 21, 1927.

Duodenal Ulcer.

Clinical and radiological observations show that in individuals with actual duodenal ulcer there are the following variations from normal gastric mobility.

1. A pronounced early hypertonus, leading to an exceptionally early evacuation.

2. A relaxation of the pylorus.

3. A late exaggeration of hunger contractions which are sensible as pain, that is to say, a late spasm of the *pars pylorica* and pylorus which is often shown radiographically by an unduly long retention of the last portion of the opaque meal.

Hurst has shown that this picture may be regarded as a vicious exaggeration of a rhythm type, commonest in the male, which shows in a radiograph the steer horn stomach outline, in contrast with the J-shaped stomach, commonest in the female. X rays have shown that these characteristics may exist without ulceration and after its cure; they appear to be familial in nature in many cases. Some other exciting cause is necessary for an ulcer to appear.

Ulcers of this peculiar type exist only in three situations, the stomach, the first part of the duodenum and at a gastro-enterostomy stoma; the one common factor is the presence of gastric juice.

Certain characteristic alterations in the chemistry of the gastric contents are the consequence, not the cause, of these alterations in gastric rhythm. In a typical case the gastric juice after the first fifteen minutes manifests an increasing acidity owing to absence of neutralization from the duodenum. The failure in regurgitation is no doubt due to the increased tonus on the gastric side of the pylorus, sufficient to prevent any reflux of duodenal secretions into the stomach.

As far as the duodenum is concerned, the effect of the morbid rhythm is the early forcible discharge into this segment of gut of an unneutralized gastric juice.

Experiments lend strong support to the view that, in duodenal ulcer at any rate the gastric juice, when discharged rapidly into the first part of the duodenum and unneutralized by the duodenal secretions, is capable of initiating and developing ulceration, the ulcer forming where from impact the damage of the mucous membrane is maximal.

In support of this view is the fact that surgeons are acquainted with a class of case in which all the symptoms of duodenal ulcer are present, along with characteristic radiographic and test meal findings, which prove on operation to be examples, not of developed ulcer, but of a duodenitis, the wall of the gut showing hyperæmia and organized lymph on the serous coat without actual underlying ulceration.

The counterpart of this condition is the "blushing" stomach wall which is commonly associated with pyloric spasm and unduly long retention of gastric contents; this condition I have often observed in the pyloric antrum in cases of chronic appendicitis and cholecystitis.

Problems of Treatment.—The problem is how to arrest the process of ulceration; how to suppress the hypertonus. Gastro-enterostomy can diminish the hypertonus if it provides a sufficient discharge of jejunal contents into the stomach. The effect of the discharge of fluid or food into the stomach, whether by the œsophagus or any abnormal channel such as a gastro-jejunal stoma, is to bring about relaxation of the hypertonus with active ulcers. However, in the opinion of some surgeons this is not enough; the ulcer should be protected from contact with gastric secretions, and this can be brought about by temporary pyloric occlusion. Even for duodenitis without ulceration some surgeons recommended gastro-enterostomy. Hypertonus may persist in spite of gastro-enterostomy; where it does, it depends upon such causes as (i) Mouth infections, (ii) infection of other viscera, (iii) irritability caused by certain foods, (iv) certain forms of intoxication, for example, tobacco. These primary causes of the hypertonic habit have to be sought for and eliminated, otherwise there is a definite risk of an ulcer developing in the region of the anastomosis.

Gastric Ulcer.

Can this view of ulcer formation be applied to gastric ulcer? It was recorded in the *Proceedings of the Royal Society of Medicine* in 1913 that Barclay, an experienced radiologist, had noted that septic conditions in the mouth and from other sources, constipation, mucous colitis and a variety of other conditions, are capable of producing spasmodic contractions of various parts of the stomach; the spasm may be so severe that it produces a narrowing of the lumen. This from time to time is of great functional importance, causing a definite obstruction to the passage of food; possibly some rough article of food may cause an abrasion (of course this is only theoretical and it is quite likely that an abrasion is not necessary). The effect is that a surface is exposed that is not structurally fitted to withstand the action of the gastric juice; in this way an ulcer is formed which perpetuates the original spasm that determined the site of the ulcer.

Gastric ulcer occurs characteristically in the hypotonic J-shaped stomach.

In these spasmodic contractions, occurring in different situations, it is not difficult to see how the effect of impact in damaging mucous membrane, eventually causing an ulcer, may come into play.

The objection that the spasmodic contraction or incisura is the consequence and not the cause of ulcer formation cannot be maintained; a fixed spasm of the circular fibres is quite a frequent experience with radiologists in patients suspected of ulcer on account of gastric pain, but proved to be suffering from gastric disorder from other causes.

In such cases the point of impact of the gastric contents when the stomach contracts, will be the lesser curvature near the pylorus or in the *antrum pylori* and in these situations of course ulcer is most common.

We can now better understand why duodenal and gastric ulcers so often follow chronic appendicitis;

it seems to me a more likely explanation than the embolic and lymphatic connexion theories.

In gastric ulcer then the disordered function is different; it is pyloric spasm of early onset and hypotonus. The result is retention of gastric contents in the stomach for an unduly long period. On the whole there is a tendency to hyperacidity, but free acid content of the gastric juice is probably not of primary importance in regard to ulcer production, either in the stomach or duodenum.

Problems of Treatment.—The remedy for gastric ulceration is excision of the actual ulcer area and the prevention of gastric stasis. Gastro-enterostomy does this, but the site of the anastomosis is of prime importance; it should be as near the pyloric end as possible and of ample size. In gastric ulcer gastro-jejunostomy is essentially a drainage operation—primarily a mechanical object.

Jejunal Ulcer after Gastro-enterostomy.

Ryle has pointed out that jejunal ulcer is particularly liable to occur in the hypertonic stomach; the ulceration developes in consequence of the flooding of the jejunum by gastric secretions at so early a stage that the alkaline duodenal secretion has not fully developed. The influence of impact is shown by their presence, either at the edge of the anastomotic ring or on the jejunal wall opposite.

There is no doubt that in many cases the presence of an unabsorbable silk or chromicized catgut stitch is an important factor.

The surgical treatment of patients with these ulcers is not at all easy, and personally I prefer to put them on Sippy's diet.

Other Abdominal Conditions.

Before discussing operative procedures, I would like to say a few words about several other abdominal conditions.

Although Arbuthnot Lane never had a very large following supporting his views about alimentary sepsis and the interference with the drainage of the alimentary canal by the various bands that he described, still I think even many of them have become converted to the view that spasm or in some cases achalasia, that is, a failure to relax is a more likely cause of delay in most cases to the onward flow of contents. This spasm is secondary in many cases to inflammatory trouble somewhere within the abdomen as a rule, particularly in those diverticula, the appendix and gall bladder. I always look upon gastric symptoms, if not due to lesions of the stomach itself, as pointing to trouble somewhere else in the alimentary canal, rather than in the other systems, such as urinary and genital. There is no doubt, however, that occasionally lesions in both these systems are the cause of digestive disturbance; in the case of the urinary apparently a nervous reflex; in the case of the genital, perhaps in some cases endocrine disturbance contributes to it, for they do seem quite common about the menopause. For their relief tablets said to contain various gland secretions, such as thyreoid, ovarian, suprarenal *et cetera*, are sometimes prescribed. I doubt whether they afford much relief and this is not surprising in the present uncertain state of endocrine therapy.

Do mechanical causes have any influence on the digestive tract? I think undoubtedly there are some cases of visceroptosis in which there is probably a drag upon the superior mesenteric vessels (supplying the mesentery), as they cross the third part of the duodenum, causing some partial obstruction and resulting in stasis in duodenum and stomach; the result of this may be an atonic dyspepsia with some acute exacerbations. But even if all were agreed upon this as a cause (and they are not) the treatment would still be a subject for controversy. I think there has been a decided inclination to do fewer fixative operations and to rely more upon medical measures such as abdominal massage, abdominal exercises and the wearing of a belt which should be put on when in the recumbent position.

Is it possible with the greater attention paid to obstetrics nowadays that abdominal muscles may not be allowed to get so flabby after childbirth, for there is no doubt that the multiparous female is a frequent sufferer. But she is not the only one; there is a type of physical contour, often inherited, which conduces to the condition of visceroptosis. For these the modern physical culture exercises which aim at chest development, rather than the old stupid method of developing individual muscles are beneficial. It seems to me that with a good chest expansion development always follows. I feel that good intraabdominal pressure is more efficient than surgical operations for keeping organs in their place and that this pressure is partly dependent upon good abdominal musculature.

Abdominal Operations.

As to the modern developments of operative procedure in the abdomen, it is almost superfluous to remind you that exploratory operations are not good surgery; we all have to do them now and again, but where an efficient X ray apparatus and skilled operator together with a skilled pathologist are available, then these backed up by a complete history should give us in most cases a good idea of what we are going to find. I am glad to say that skilled X ray operators and pathologists are not now limited to the city.

But apart from them, there is the history which can be taken regardless of place by anyone who has some knowledge of disease together with a few years' experience behind him. I do not think the value of a good history, not forgetting the past and the family history, can be exaggerated.

My objection to exploratory operations is that they involve too much handling and pulling about, with probably much retraction of the abdominal wall. When we realize how delicate the peritoneum is and how it must be roughened by vigorous retraction and that this forms the starting point of an adhesion; when we further recall how frequently patients suffer from painful adhesions after an abdominal operation, painful because of the pull

upon that very sensitive structure, the parietal peritoneum; then we have cause to reflect that after all abdominal surgery must be approached with all humility and in gentleness, lest the patient suffer more pain than that which we operated to relieve.

In gastric surgery there is still of course no unanimity, but I think I may say that for gastric ulcer a usual procedure is to excise the ulcer (some remove it with the cautery, like Balfour) and then do a gastro-enterostomy. Sherren maintains that a gastro-enterostomy alone is sufficient, provided it is done on the proximal side of the ulcer. These operations are certainly not free of risk, as any surgeon knows who has tackled an ulcer high up on the lesser curvature or one adherent to the pancreas. Sleeve resection is sometimes done and it is completed either in the manner of a Billroth II operation or of a Balfour Polya, that is an anastomosis of the open end of the stomach with the jejunum brought round anterior to the transverse colon. Moynihan's modification, namely, bringing a short loop of jejunum across the splenic flexure, is probably an improvement. These latter two are time-saving operations, but the Billroth II is very satisfactory.

As regards suture material I am beginning to think that such unabsorbable materials as celluloid thread and silk for the sero-muscular coat had better be replaced by fine chromicized gut. The needle must on occasions go deeper than the sero-muscular layer and possibly an unabsorbable stitch may form the starting point of an ulcer at the site of the anastomosis. This is Moynihan's firm conviction.

As for duodenal ulcer, opinion is almost unanimous that gastro-enterostomy is the best procedure in most cases. Moynihan supplements this by cauterization of the ulcer. I am tempted at times to do a pylorectomy, including the first part of the duodenum, but if there are many adhesions, this may be a difficult operation and is not justified.

There is no doubt whatever that the non-success of some gastric operations is due to the fact that they are not followed by medical treatment and suitable diet for a considerable time. All septic teeth should have been attended to several weeks before the operation; extraction at the time temporarily increases the sepsis and may prejudice the healing of a stomach wound.

As to hæmatemesis, rarely is operation done, but I think there are undoubted exceptions. We lose an occasional gastric patient who might have been saved by excision, preceded and followed by blood transfusion. I doubt the hæmostatic value of blood transfusion; it is a valuable means of enabling the patient to stand an operation, rather than a means of stopping the hæmorrhage.

Regarding hæmostatics, I am inclined to think "Fibrogen," given subcutaneously or orally, is more valuable than most.

Adhesions.—Is operation for adhesions worth while? Yes, I think so, provided you have good assistance and a good light and are prepared, after dividing them, to bury and oversew them, leaving a smooth peritoneal surface. The great relief that I have afforded some of my patients, perhaps makes me unduly optimistic, but I readily recognize that there are some that are too extensive to touch.

Peritonitis.—General peritonitis is fortunately rarer than formerly, due to the improved diagnostic methods and greater all-round knowledge of today. Localized, particularly pelvic, peritonitis is common enough, but is rarely fatal. General peritonitis starts in the lower part of the abdomen and works its way upwards. Recognition of the fact that there are coils of the small bowel in the upper part of the abdomen which have not yet become infected and paralysed, even in general peritonitis, has led to a method of treatment that has saved patients in an otherwise hopeless condition. For it we are indebted to Sampson Handley. Realizing that death was due to the absorption of poisonous substances from the paralysed gut (the toxicity is higher in the jejunum than in the ileum) he advocated doing an anastomosis between the jejunum and the transverse colon, following this with a caecostomy. His argument is that regurgitation of toxic contents takes place through the anastomosis, thence down to the caecum and out through the drainage tube. Naturally the primary focus is attended to. I have only had occasion to try it once; it was not successful in saving the patient, but his condition was extremely advanced. Some surgeons have tried jejunostomy alone.

Drainage of the Abdominal Cavity.—The question of drainage of the abdominal cavity is apparently not yet settled. For myself I have very definite views, namely, that for loculated collections of pus I always use a drain, but when the pus is free within the peritoneal cavity, I never use one. Some still insert drainage tubes in these cases; I have never seen either harm or good result from them, provided they are restricted to the large bowel area, but if inserted suprapubically or anywhere else within the small bowel area, I think they are dangerous, as well as useless.

Intestinal Obstruction.

The mortality from intestinal obstruction is still very heavy, due largely to delay in diagnosis. I think better technique is leading to fewer cases from adhesions to operative scars and that quite a large number are cases of subacute obstruction, the result of malignant disease of the large bowel.

Whatever the cause, enterostomy in one or two places (one above the umbilicus, the other below) to empty the toxic contents of the small bowel, in addition to the other steps of the operation, may make the difference between life and death.

It has always been recognized as important to milk the distended coils of the small bowel and it is done through a temporary opening, but there is always danger of soiling the peritoneal cavity and the drainage is only evanescent.

To ensure that the enterostomy wound may close readily, it is either inverted by several purse-string sutures or brought through a hole in the omentum. To anyone who has seen the pain and discomfort of a discharging jejunal fistula, this improvement will appeal.

The treatment of intestinal obstruction may be summarized shortly:

1. In the early stage it is necessary to treat only the cause.

2. In the second stage, when much distension of the bowel has occurred, the obstruction should be relieved and jejunostomy performed; drainage may be required only for a day or two.

3. In the third stage the condition of the patient must be improved if possible by intravenous injections of a 20% solution of sodium chloride (about sixty cubic centimetres) or even blood transfusion; then exploration, using a 0·5% "Novocain" and adrenalin as a local anæsthetic for the abdominal wall, reserving gas and oxygen for the intra-abdominal manipulations.

The treatment of the obstruction (if the bowel is gangrenous, it is stitched and drained outside the abdominal cavity) is followed by single or multiple enterostomy. To do this the bowel is drawn through a hole in the omentum, a de Pezzer's catheter is inserted with a fine chromicized cat gut stitch and the bowel is replaced through the hole in the omentum which then lies snugly around the tube; the tube is brought out through a fresh stab incision in the abdominal wall. Through the tube glucose and saline solution can be given in the intervals between drainage.

Ethereal rubber cement solution, one in four, applied several times a day is useful for preventing excoriation of the skin.

Hernia.

The only recent developments in the radical cure of hernia is the use of living sutures to fenestrate the gap between the structures surrounding the hernial opening; this opening may be a large one in direct inguinal herniæ of long standing or in ventral herniæ. They are made of strips of *fascia lata* from the thigh and threaded through Gallie's needles. I have done it only once and here I regret to say the wound suppurated and the fascia was cast off as a foreign body.

The theory underlying the application of living sutures is sound and conforms with the principles of plastic surgery, namely, that healing is always favoured by the absence of tension.

Another useful device which I have found very satisfactory in a large direct inguinal hernia, is the reflection of a semicircular flap of aponeurosis from the internal oblique and rectus muscles down to unite with the inguinal ligament. Living tissue with a pedicle is thus united without tension, instead of aponeurotic structures (which are never very vascular) being brought together under tension.

Wound Treatment.

I think there has been greater progress in wound treatment than in most branches of surgery; the mass of material provided by the Great War enabled much experimental work to be done and the position to be clarified. In 1917 I saw the work at Compiègne where Carrel and Dakin introduced their treatment; all experience since then has only confirmed my conviction that "Eusol" and Dakin's solution are without a doubt the most reliable antiseptics that we have and I never have occasion to use any other. Of course the Carrel-Dakin treatment as carried out in military surgery is rarely applicable in civil life, but the application of gauze saturated in either "Eusol" or Dakin's solution (undiluted) to the surface of a septic wound will soon clear it up. Good antiseptics as these are, they do not equal in importance drainage in the most dependent spot, which is really the crux of the treatment of septic wounds. Nothing will ever replace this. As a trivial instance of the importance of drainage the removal of a hair with the epilation forceps will often prevent a pustule from giving a lot of trouble. I would class epilation forceps as one of the most useful instruments a general practitioner could have.

When we reflect, we realize that, with the exception of the antiseptic treatment, all other methods, foments, baths *et cetera*, simply multiply the blood supply to the part, so that *vis medicatrix naturæ* is still the predominant feature.

Thank goodness we have put behind us the day when the dipping of a hand, instrument *et cetera* for a very short time into an antiseptic solution was thought sufficient to sterilize it. We realize that antiseptics are not wonder-workers; even they require time to effect their object. We also realize more clearly that they should be innocuous to the tissues.

What money and faith we have wasted in expensive antiseptics for the want of a little clear thinking!

Elephantiasis.

Elephantiasis is not a very common condition, but my excuse for mentioning it is that hitherto it has not been amenable to treatment. Lymphangioplasty has been tried, but in most cases with only temporary success, if any.

Kondoleon, of Athens, introduced a method by which strips of tissue, comprising superficial and deep fascia, extending the whole length of the limb on its outer and inner side, are removed; this allows more ready communication between the superficial and deep lymphatics. Tried in the Mayo Clinic it has given some quite satisfactory results. I am about to operate by this method in two cases of this nature at the Sydney Hospital.

Empyema.

The best treatment for empyema is still debated. I rather think there are not many advocates for aspiration now. The work in the American training camps in the Great War where they had a great many empyema cases, attracted my attention some years ago. They found the Carrel-Dakin method to give the best results. I have found nothing to equal it, having sterilized the cavity and been able to remove the tube in some cases as quickly as fourteen days. Care must be taken that no air if possible enters the pleural cavity, hence these patients require intelligent nursing. Our aim is to allow the lung to expand and to obliterate the cavity as quickly as possible; a sure way to prevent this is to allow air in and the sepsis become chronic, thus causing fibrosis of the visceral pleura, binding the lung down.

Blowing Wolf's bottles or toy balloons are very useful aids.

Incidentally this method solves the disputed question of the best site for the thoracotomy; the sixth rib about the mid-axillary line is the most suitable; if the opening is made posteriorly, the patient lies on the tube and prevents it working satisfactorily.

Fractures.

More attention to fractures of recent years has resulted in improved results. Yet the simple truth remains that the most important factor still is the early administration of a general anæsthetic with manual extension and attempted reduction; nothing ever quite replaces the omission to do this. Skeletal extension by means of hooks is a valuable addition, especially in the bad cases with much overlapping.

Personally I am very partial to Lane's open operation, especially in those difficult fractures in the lower third of the leg. I find that relief of pain is greatest with the best anatomical replacement; function is also most satisfactory with the best anatomical position. This particularly applies to the lower limb which is weight-bearing.

But before doing an open operation a surgeon must be sure of his staff and surroundings; no risks can be taken.

The three plaster method is very useful, being founded on sound surgical principles. I have used it for both upper and lower limbs. I think our methods of extension in the upper limb are not very satisfactory, hence in upper limb fractures I think the three plaster method is quite valuable.

Head Injuries.

Since the introduction of lumbar puncture for head injuries the mortality is lower, convalescence quicker and after symptoms fewer. Subtemporal or suboccipital decompression is seldom done now for these acute cranial injuries. There is also a clearer conception of the varieties of head injury.

To call a condition "concussion" when the period of unconsciousness is prolonged, is becoming more rare, though not yet extinct.

I think cerebral concussion, contusion and laceration sufficiently define the conditions, though of course they are not all clear-cut. The presence or absence of a fracture of the skull, though looming largely in the eyes of the public, we know not to be an important factor. I have seen severe cerebral injuries without any fracture.

Of course we must always be on the watch for the fourth type, namely, extradural hæmorrhage.

Quite the best treatment for severe subdural injuries is lumbar puncture, repeated several times if necessary. It brings the patients round to consciousness more quickly and averts much of the after headache. If in an adult not more than thirty cubic centimetres are withdrawn at a time, there is no risk attaching to it.

Trigeminal Neuralgia.

In trigeminal neuralgia an important advance has been made, namely, the recognition that the diffuse neuralgia may originate in a minute neuroma at the site of an extracted tooth, analogous to the neuroma in an amputation stump.

Excision of the mucous membrane has in several cases of mine given brilliant results and avoided the necessity of a mutilating operation, such as the excision of the Gasserian ganglion.

Burns.

For burns there is nothing to approach painting on of the No. 7 Paraffin. This was introduced during the war and is based on the French product "Ambrine." Painted on every second day, it is both comfortable and effective.

For the first dressing gauze soaked in 5% picric acid solution tends to ease the pain.

THE ORTHOPÆDIC ASPECT OF LOW BACK PAIN.[1]

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THE subject of low back pain can be mutually studied with advantage by gynæcologists and orthopædic surgeons and an endeavour can be made to formulate some guiding principles which may assist the surgeon to differentiate the intrinsic non-pelvic from the true pelvic type of pain. At the same time it has to be remembered that the symptoms of many patients with low back pain arise from conditions that pertain to both branches of surgery. A sacro-iliac defect may coexist with some pathological condition of some of the pelvic viscera.

It is not intended to enter into an elaborate dissertation upon the anatomy of the spine and posterior pelvis. I wish, however, to call attention to the important part played by ligaments and muscles in maintaining the integrity of the lumbo-sacral and sacro-iliac joints. The latter joint depends for its stability not so much on the mutual adaptation of its articulating surfaces as on the strong ligaments which bind the two bones together. A glance at a pelvis with the ligaments intact will serve to impress upon us the importance of the subsidiary ligaments, the ilio-lumbar, the sacro-tuberous and the sacro-spinous.

By means of the latter two structures the lower portion of the sacrum, namely, that distal to the sacro-iliac joint is firmly stayed down to the ischium. They most effectually resist any tendency of the sacrum and overlying vertebræ to tilt or rotate forward at the sacro-iliac joint. By means of the ilio-lumbar ligaments the sacrum and lumbar vertebræ are slung to the ilium, further preventing in conjunction with the ligaments previously mentioned any forward rotation of the sacrum.

Ætiology.

The causes of pain in the region under discussion which concern the orthopædic surgeon are: (i)

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on October 27, 1927.

trauma, (ii) inflammatory conditions of bones, joints and soft tissues, (iii) anomalies of spinal and posterior pelvic structures and function and flat foot, (iv) new growths of bone.

Injuries to the back may be direct or indirect or both and it is very essential to elicit a careful history in order to determine which type has affected the patient.

Direct injuries may cause severe contusion of the soft tissues without doing any damage to bones or joints. Muscles may be bruised and torn with hæmorrhage of varying degree occurring in and about the muscles and intermuscular planes. Such injuries cause at the outset disability in proportion to their severity and we must remember that a late sequela of such injuries is the formation of adhesions. These should always be suspected in cases of direct injury when pain and limitation of some or all movements remain after the acute symptoms have disappeared.

A radiogram which manifests no evidence of bone lesion following an injury to the lower part of the back, should not be allowed to dominate the surgeon's estimate of the damage the patient may have sustained.

Following direct injury we may find that one or several lumbar transverse processes have been fractured. I have not seen this fracture occur apart from direct injury.

As a result of indirect injury we find that sprains particularly of the sacro-iliac joints predominate. In severe injury of this type the possibility of a crush fracture occurring in one or more of the lumbar vertebræ must be kept in mind.

A crush fracture of one of the lumbar vertebral bodies may have for symptoms and signs no more than pain in the lower part of the back and some limitation of movement. Wallace in reviewing eighty-two cases of this type of spinal fracture found in sixty of the cases in which the necessary data was available, that pain, either referred or local, occurred in 83·3% and that paralysis was absent in 70% of seventy-eight of the patients.

By far the greater number of the fractures occurred in the lumbar region and of the individual lumbar vertebræ the first and second were very much more liable to fracture of this type than the remaining three. A further point of great practical importance to be learned from his study is that this type of fracture most frequently follows an injury in which the spinal column is forcibly flexed. Sixty-seven out of seventy-six patients in whom the type of injury was noted, gave a history of injury which caused forcible flexion of the spine.

The symptoms of patients seen late may arise from adhesions, osteoarthritis, Kümmel's disease (rarefying osteitis) of one or more of the vertebral bodies or possibly the pain may arise from the resultant faulty posture.

Inflammatory conditions which most frequently give rise to low back pain of the type under discussion are osteoarthritis, rheumatoid arthritis and tuberculous disease of the intervertebral, lumbo-sacral and sacro-iliac joints and of the vertebræ, sacrum and ilium.

The changes characteristic of the condition known as osteoarthritis are frequently discovered in the course of routine radiographic examination for the detection of renal and abdominal lesions.

These changes may exist to a considerable extent in the knee and other joints without giving rise to pain or such symptoms as might lead the persons concerned to seek advice and treatment.

It is not uncommon to find such changes pronounced in persons whose complaint is of pain of but a few weeks' duration.

In such cases it may be reasonably argued that osteoarthritis exists as a potential predisposing cause of pain and that some other factor, particularly in the shape of mild trauma or unaccustomed activity, is necessary to convert it into a symptom-producing entity.

This conception is important since it shows the necessity of our attempting to ascertain just what this extra factor may be, since its elimination is necessarily the first step to be taken towards curing or relieving the pain.

Pain associated with osteoarthritis occurs most frequently in persons over forty years of age and is frequently of the referred variety. A common experience is to have a patient of this age complain of pain down the back of the thigh or on the outer aspect of the calf, whilst the history will reveal the fact that it began in the lower part of the back and persisted there for a varying period before moving entirely or in part into the lower limb.

Rheumatoid arthritis is seldom confined to the lower part of the spine. It occurs usually either as the von Bechterew type of spondylitis in which the spine alone is affected, or the Marie Strumpel variety in which the shoulders and hips are affected as well as the spine.

At the moment of writing I have under my care a female patient who has definite clinical signs of a chronic infective process in one sacro-iliac joint. This woman has an infective pelvic condition following childbirth and I have no hesitation in classifying her condition as rheumatoid arthritis of the sacro-iliac joint. I cannot recall having been able to diagnose this condition with any degree of certainty in a fairly extensive number of cases of pain in the lower part of the back.

The features of tuberculous disease of the lower part of the back cannot be elaborated in a paper such as this. The possibility of pain in this region being due to tuberculous disease of one or more of the joints and particularly of the sacro-iliac joint must be kept well in mind and too much reliance must not be placed upon the results of radiographic examination particularly in the early stages.

A study of the composition of the boundaries of the intervertebral canals, as revealed in an anatomical preparation, is full of interest in relation to the referred pain so often encountered in inflammatory conditions in this region. It will be seen how closely related to the canals and their contents are the margins of the joints between the

vertebral bodies and between the transverse processes, and how readily compressed these contents might be if these joints become swollen and their margins the site of osteophytic outgrowths.

A by no means rare condition found in association with pain in the lower part of the back is *osteitis deformans* or Paget's disease affecting the lumbar vertebræ and the elements of the sacro-iliac joints.

Anomalies of Spinal and Pelvic Structure.

To the American school of orthopædic surgeons headed by Goldthwait, Osgood and Lovett, must be given the full credit for placing the study of low back pain on a sound and rational basis founded on a systematic study of the pathology and symptoms of the different types.

The two former in 1905 published a paper based on the study of motion in the joints of the pelvis. They concluded that a definite relaxation in these joints occurred in some cases as part of a normal physiological process during menstruation and also during pregnancy. They distinguished a third group in which relaxation is due to trauma, general weakness or some definitely known pathological process. The patients in this group comprise male and female adults and children and are more numerous than and present many points of difference from the patients of the first two groups. The studies of Goldthwait and Osgood established strain and subluxation of the sacro-iliac joint as a definite pathological entity.

Lovett found that apart from obvious causes, for example, trauma, inflammation *et cetera*, there was a large number of cases in which the pain arose from causes not easily identified. Whilst admitting the actuality of sacro-iliac strain, he regarded it as occurring much less frequently than was generally supposed and regarded the pain in the latter group of cases as being largely of static origin.

Reynolds and Lovett studied the position of the centre of gravity in the body in its relation to certain bony landmarks in the erect position and put forward the view that backache of this type arises from a forward displacement of the centre of gravity, causing overstrain of the posterior musculature of the trunk and lower extremities.

Briefly their contention is this: The body is held erect in normal persons without any sensible muscular effort, although a consideration of the weight of the trunk will show how great is the effort required to prevent the spine from flexing and the trunk from dropping forward at the hips.

If the centre of gravity is displaced forward then a greater continuous effort has to be made by the muscles in question to resist this tendency to fall forward. This sets up a continuous strain in muscles and ligaments which is expressed by pain in the back and in many cases in the lower limbs as well.

That the static type of backache exists and is found very frequently in persons of poor physique and of faulty posture is definitely established. At the same time not all such persons have backache and in persons suffering from scoliosis pain is the exception.

The next factor to receive attention in the study of this subject was the change of form and other anatomical peculiarities frequently observed in the fifth lumbar vertebra. These anomalies are of frequent occurrence as revealed in radiograms of the lumbo-sacral region.

The fifth lumbar transverse processes may be enlarged on each side or the enlargement may be unilateral. They may as a result impinge upon the upper surface of the sacrum or on the wings of the ilia on one or on both sides. In many cases a definite joint is found at the point of impingement. Goldthwait in one case found a bursa formed in this situation.

In many cases there is bony fusion between the enlarged wing like process or processes and the upper surface of the sacrum. In these latter cases a definite narrowing of the intervertebral foramen between the fifth lumbar and the first sacral vertebræ is seen radiographically.

Goldthwait explained the resultant pain as arising from adverse leverage at the lumbo-sacral joint when the sacralization of the fifth lumbar vertebra occurred only on one side and as arising from the crowding together of the impinging bony surfaces due to faulty posture when it was bilateral.

There is one consideration I would put forward in discussing the relation that may exist between these frequently noted anomalies and low back pain. These anomalies are congenital and yet symptoms which are ascribed to them, rarely arise until the middle years of life. In this respect they show an analogy to cervical ribs which, existing as a congenital anatomical variation, seldom cause symptoms until after thirty years of age.

I would suggest that the most logical view to take in attempting to explain the onset of symptoms is to regard the latter as arising from some factor superimposed upon the already existing anatomical peculiarity. This attitude of mind is of value when we come to consider the question of treatment. A direct surgical attack upon the supposedly offending transverse processes has been advocated of late, particularly by the American school, but I consider it would be wise to attempt first to discover what this secondary factor may be and to attack it before attempting to resort to such radical measures as our American colleagues advise.

Faulty posture acquired as the result of illness and unsuitable occupation over a long period, trauma and unaccustomed activity in persons of sedentary habit are all competent to produce symptoms in persons presenting this type of anatomical variation.

It would seem that any one set or any combination of the factors so far discussed in this last section is capable of giving rise to pain in the lower part of the back and that a too strict adherence to either the sacro-iliac, the static or the lumbo-sacral anomaly theory is to be avoided. The merits of all three have to be very carefully weighed in

attempting to find a cause in many cases of low back pain.

Spondylolisthesis or displacement forward of the spine at the level of the fourth or more frequently the fifth intervertebral joint is found in persons of both sexes. It may be of very mild degree and only discovered as the result of radiographic examination or the displacement may be so gross as to present unmistakable signs on clinical examination.

In one case in my own experience, that of a young girl of sixteen, the condition developed rapidly, so that within six months a definite and distressingly painful and crippling degree of deformity developed.

Although a displacement of this type is usually associated with backache, it is surprising how little pain and inconvenience may be associated when it exists to a pronounced degree.

The ætiology of this condition is obscure. In some of the cases seen by me radiograms have revealed failure of fusion between the two halves of the lamina of the fifth lumbar vertebra. This would indicate, in these cases at least, a congenital weakness or error of structure in this region of the spine. Trauma of moderate degree, if oft repeated, seems to be a competent factor in making the condition evident.

I have the skiagram of a male patient which shows a definite displacement forward of the spine on the underlying vertebræ at the level of the joint between the fourth and fifth lumbar vertebræ. He attended hospital complaining of pain in the back following an injury.

Pain in the back, associated with an error of body mechanics in the region of the feet, is frequently encountered and an examination of the manner in which the weight of the body is transmitted through the lower limbs to the feet, as well as the manner in which the feet deal with this weight, should always be carefully made when the cause of a pain in the lower part of the back is sought.

Backache associated with faulty foot mechanics is in most cases a symptom of a general weakness and faultiness of body posture.

A brief mention only need be made of the part played by new growths in causing pain in the lower part of the back. The possibility of a secondary growth in one of the bones as the result of a focus in breast, uterus, bowel *et cetera* must always be kept in mind.

A woman of forty odd years complained of continuous pain in the lumbar region of the spine. No objective abnormal signs could be detected. Both breasts had been amputated six and seven years previously for "adenoma." X ray examination revealed a secondary malignant growth in the first lumbar vertebra.

Examination of the Back and Sacro-Iliac Regions.

The patient should be stripped to below the waist, with the underclothing fastened with a tape at the level of the trochanters. Shoes and stockings should be removed. He or she should stand with the back to a good light.

Most patients when under observation tend to hold themselves in an attitude which is not habitual to them. An endeavour should be made to have them walk, sit and stand in the manner which is usual with them, in order that any departure from the normal in posture, gait *et cetera* may be estimated. The alignment of the spine in the antero-posterior and lateral planes should then be noted. Any tilting of the pelvis indicated by dropping of the anterior-superior iliac spine on one side is looked for. The length of each lower extremity is measured. The movements of the spine are examined. Forward bending, standing and sitting are carried out, whilst any rigidity in any section of the back is sought by inspection and palpation.

Side bending is estimated in the following manner. The patient stands erect and then without lifting the feet of the opposite side bends the trunk first to one side and then to the other. Movement forward should be avoided. The fully extended upper limb is allowed to slide down the thigh and leg as the body is bent laterally. When the fullest range possible has been covered, a mark is made with a skin pencil on the lower limb opposite the lowest point of the extended fingers, namely the tip of the middle finger. Any variation between the extent to which bending can be carried out on either side can then be easily noted by a comparison of the levels of the pencil marks. The movement of rotation of the spine is carried out normally in the thoracic region so that it is unlikely to be restricted by any cause operating in the lumbar and lumbo-sacral regions. In scoliosis affecting the lumbar and dorso-lumbar sections of the spine the usual rotation of the vertebral bodies towards the side of the convexity will be noted or, as pointed out by Lovett, in certain types of scoliosis this rotation may be in the direction of the concavity of the curve.

The levels of the inferior angles of the scapulæ should be examined and any winging of the scapulæ, often the accompaniment of a "weak" type of back, should be noted. Carefully examine the alignment of the body weight through the lower limbs upon the feet and look for any errors in the feet themselves which might have a bearing on the condition complained of.

Have the patient indicate as accurately as possible the site of the pain and then seek for any points of tenderness noting their local relationship with the pain.

In examining for tenderness I have found the following method most useful. Commencing in the midline and starting about the level of the first lumbar vertebra, press firmly two fingers working downwards towards the lower part of the sacrum, covering all the ground carefully. Then begin again at the former level, but a little to the right or left and again work downwards. Continue in this fashion until the whole of the lower part of the back has been carefully and methodically palpated. Ask the patient to say "yes" whenever he feels pain on pressure and mark the spot indicated with a small cross by means of the skin pencil. This method gives at times very interesting results

and makes it very difficult for the patient whose backache is of the imaginary or malingering type to conceal discrepancies in his complaints. Rigidity or freedom of movement of the spine already noted on movement of the back will be confirmed by palpating the spinal muscles and noting the presence or absence of spasm.

Palpate the bony structures carefully to detect any irregularity. Spondylolisthesis is often indicated by a falling away of the spine of the fifth lumbar vertebra immediately above the sacrum.

Test the knee jerks and in cases where the history and symptoms indicate examine *per rectum*, particularly noting any sign of new growth or of swelling and tenderness about the sacro-iliac regions.

The patient should lie on the back and the effect of flexing the extended lower limb at the hip be examined. In this manœuvre the hamstrings are rendered taut and thus exert a pull at the sacro-iliac joint through the pelvis.

In inflammatory conditions or in the presence of sprain of this joint it will be found that pain in the back is complained of and if the patient be asked to place a finger on the painful spot, he will indicate the region over the joint in practically all cases. Sometimes this manœuvre causes pain to be referred along the sciatic nerve on the same or the opposite side. Spasm of the hamstrings often occurs as the pain is complained of.

In cases of this type it will have been noted that forward bending of the spine can be carried out only by bending the hips and knees and in the sitting posture the bending movement is also free and usually painless.

In lumbo-sacral and lumbar trouble bending forward can take place only at the hip joints, the spine being held rigid.

A careful radiographic examination should be made in two planes and a stereoscopic picture in the antero-posterior plane should be taken after the bowel has been emptied of both fæces and flatus. The whole of the lumbar and sacral regions should be included in the area examined.

Treatment.

In traumatic conditions rest until healing and resolution in lacerated, bruised or broken tissues are complete should be aimed at.

The degree of rest must be decided by the severity of the underlying condition and the means by which it can be established varies from strapping the back by intercrossing layers of adhesive plaster to the application of a plaster brace or recumbency in a plaster bed.

As soon as practicable active movements should be commenced and when adhesions are accurately diagnosed manipulation under an anæsthetic may be called for.

In this form of disability, as in all others where exercises to strengthen muscles, free joints and correct weak and faulty posture are required, I regard swimming as undoubtedly the most suitable exercise.

In inflammatory conditions also rest is the chief desideratum and only that degree of rest which relieves symptoms rapidly and effectively, is sufficient. In chronic cases a well fitting belt or well moulded spinal or lower spinal brace usually gives great relief. In the acute cases a complete immobilization of the lower part of the back and of the hip joint of the same side is often necessary.

When faulty posture and muscular weakness are the factors to be controlled, carefully graded exercises, beginning in some cases in recumbency and reeducation of the spinal and abdominal muscles, are necessary. Here, too, the wearing of a light corrective brace is often of value. Swimming has everything to recommend it. Correction of visual errors is often called for in this type and the patient should be helped to overcome any departure from the normal action of the limbs in walking and standing.

I have always found it most useful in this type to explain fully to the patient the rationale of the measures proposed, so that he may be in a position to carry them out intelligently and in full cooperation with the masseuse or masseur.

Mention has already been made of the operative treatment advised by the American school for the relief of pain in the presence of sacralization of the fifth lumbar vertebra and argument has been put forward in favour of preliminary conservative measures. If an attempt be made to ascertain the factor which has turned the scale against the patient, it will be possible often to bring the latter back to the point where his sacralization remains, as it always has been, a potential cause of trouble in this region.

Of those factors, trauma, either severe or slight, as in the case of a man of middle age who takes up golf for the first time or develops a practical interest in gardening, is the most frequent offender.

When the pain is intermittent and of moderate severity a low back brace is usually sufficient to give practically full relief.

I have found that many patients are relieved by wearing a Thomas posterior spinal support in addition to a firm belt about the lower part of the back. As the condition settles down, the spinal support is gradually discarded, but the belt is retained.

It is a useful measure in some cases to test the reaction of the condition to local rest by applying crossed overlapping layers of adhesive strapping to the whole of the lower part of the back. If relief follows, then a brace or brace and belt should be used.

In severe cases, particularly those associated with sciatica, a plaster of Paris spica including the lower part of the thorax, pelvis and the thigh of the affected side will be found to give relief in practically all cases.

Patients so severely affected may be allowed up in the spica, but will best maintain relief, if made to use crutches. A light patten beneath the sole of the shoe on the sound side, enables weight bearing

to be comfortably avoided on the affected side. When the patient has been free of all symptoms for ten or twelve days, weight bearing may be gradually taken up and then the spica is split so as to allow removal for increasing periods daily until it is possible to discard it.

In selected cases particularly of definite sacro-iliac subluxation or inflammation and also in certain cases of pain associated with sacralization of the fifth lumbar vertebra, stabilization of the sacro-iliac and lumbo-sacral joints respectively by means of a bone graft or an arthrodesis is the most suitable measure.

Spondylolisthesis is best treated by bone graft immobilization of the lumbo-sacral or the joint between the fourth and fifth vertebræ, after the fullest measure possible of reduction of the displacement has been effected.

In a case mentioned above of a young girl in whom the condition had almost an acute onset, a very satisfactory degree of reduction was obtained by heavy traction in the line of the deformity, commencing with a pull on the lower limbs in the vertical position, in exactly the same way as is adopted in dealing with a fractured femur in an infant. The angle of hip flexion was gradually decreased until an almost horizontal pull was being maintained.

LOW BACK PAIN.[1]

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THESE notes include a brief review of some gynæcological causes of backache, a few histories illustrating mixed cases and some more obscure cases and a summary.

Most of the back pain complained of by women who consult the gynæcologist, is felt in the lumbo-sacral region. It is most often sacral, but may be lumbar or lumbo-sacral and sometimes lower dorsal.

In a consecutive series of approximately four hundred hospital case histories about 40% of the patients complained of pain in the back.

These histories included various classifications such as adnexal inflammation, benign tumours of the uterus, displacements, ovarian tumours, pelvic floor weaknesses and so forth.

This analysis, though perhaps only approximate, will serve to indicate the frequency of low back pain as a symptom.

In considering the ætiology we are confronted by a broad field which involves the domain of gynæcology, orthopædics, urology and medicine and it has been aptly stated that in investigating any individual case we must remember that muscles, ligaments, bone and nerve tissues, as well as viscera may be concerned.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on October 27, 1927.

The diagnosis and treatment of a case may be simple. On the other hand it may demand the careful coordination of two or more specialties.

It is conceivable that a patient with, for example, a moderate relaxation of the pelvic floor, an uncomplicated retroversion or some other gynæcological lesion might be subjected to operative treatment when the essential cause is an entirely different lesion. Some time ago I saw a patient who had a chronic backache. She had a retroverted mobile uterus of normal size. She had a static foot error which was corrected and her back pain disappeared. She later became pregnant and went successfully through to term. The foot condition was the essential lesion.

I have at present a patient who complains of severe sacral backache; she has a relaxed pelvic floor, a lacerated, eroded cervix and a retroverted uterus. She has also flat foot and a spur on one *os calcis*. The pelvic condition will be treated by operation and her flat foot will also receive attention, but the spur I do not think is concerned.

Perhaps the most common gynæcological lesion producing back pain is retrodisplacement of the uterus associated with adhesions or with some inflammatory adnexal condition. The pain is often sacral, but may be lumbo-sacral and sometimes lumbar and there may be referred pain in the distribution of lower spinal nerves.

In *multiparæ* retroversion is a more common cause of more or less constant backache because of the associated pathological condition, such as cervicitis, enlarged uterus or endometritis.

In young people and the elderly uncomplicated retroversion may and frequently does exist without serious symptoms. The hospital records tend to indicate that uncomplicated retroversion in young people causes dysmenorrhœa rather than persistent back pain. In connexion with retroversion it may be of interest to note that cases of pronounced cervical anteflexion are often diagnosed as retroversion, the prominent posterior part of the cervix, especially when palpated through the rectum in young girls, being taken for the body of a retroverted uterus. It is not uncommon for a correction operation to be recommended in these cases.

Andrews has drawn attention to the frequency of the mistake in diagnosis in an article in *The British Medical Journal*.

In cases of uncomplicated retroversion when the condition is suspected of causing symptoms, a good test is the replacement of the uterus and the placing of a pessary.

Two points are important in this connexion, first the uterus must be completely restored and secondly sufficient time must be given because sometimes relief is not observed until the uterus has remained for a considerable time in the correct position.

Prolapse.

In the earlier stages of descent of the uterus, when the stress is on the resisting supports, the back pain is often more severe than when the sup-

ports are completely relaxed and definite prolapse has occurred.

In some cases of what appears to be minor injury of the pelvic floor and little if any uterine or vaginal prolapse, the backache may be severe and the pelvic floor weakness may not be correctly assessed, unless the patient is examined while she is making a hard straining effort.

In a hundred histories of cases of cystocele, rectocele, cystocele and rectocele and various degrees of prolapse of the uterus, about one half of the patients complained of backache. Severe degrees of prolapse are frequently seen in elderly women who are sufferers from rheumatism, osteoarthritis and the like. It is often the associated condition and not the prolapse that causes the back pain.

Adnexal Inflammation.

In a series of two hundred case histories of adnexal inflammation, approximately one-third of the patients complained of back pain. It is apparently more evident when the appendages are adherent in the pouch of Douglas and not so evident when the adhesions do not involve the parietal peritoneum.

It is most often sacral, sometimes lumbo-sacral and sometimes lumbar, radiating to the ilio-inguinal region.

Small, quiescent, sealed tubes which are adherent in the pouch of Douglas, sometimes appear to cause back pain. Likewise the slowly resorbing parametritis may cause back pain which frequently disappears with suitable treatment after a time.

In the assessment of these cases the general condition of the patient is an important factor and the debilitated, anæmic, toxic, poorly conditioned patient has, as Behan puts it, a lowered threshold to pain perception and sufficient attention should be given to general treatment.

Tumours.

Uterine and ovarian tumours produce back pain, in the case of large tumours by pressure effects and of smaller tumours if under tension, such as in subperitoneal or intraligamentary development.

Degeneration in a fibroid tumour is often indicated by tenderness and pain which may be in the back. When an ovarian tumour is fixed and causes back pain and particularly referred leg pains, I am always suspicious of some unfavourable change such as malignancy or infection. It is common for the proliferating papillary tumours to have such an effect.

As an illustrative case I have recently treated an unmarried nulliparous girl who had a right-sided, mobile ovarian tumour the size of a goose egg, discovered during examination for dysmenorrhœa. Some months later she developed fresh symptoms in the way of severe sacral backache, fairly constant and radiating to produce severe sciatic pains. The tumour had become much larger, fixed and tender. Operation proved it to be a papillary cyst which had broken through and become adherent to the pelvic wall in the region of the sacral plexus.

Cervicitis.

Chronic cervicitis *per se* is variable in its effect. Both the lacerated, hyperplastic, eroded condition and the typical, chronic endocervicitis with its rope of tenacious discharge may exist without producing back pain.

In other cases low backache is felt, probably more in those cases with associated uterine conditions, such as subinvolution or severe corporeal endometritis.

The question of treatment need not give trouble here, however, for apart from the discharge, it is very unwise for unhealthy conditions of the cervix to be neglected, especially in patients round about the climacteric.

The use of diathermy and the cautery has simplified the treatment of many of these cases.

Fibrosis Uteri.

In thirty cases classified as *fibrosis uteri*, unassociated with any other gross or minor lesion likely to cause back pain, it was complained of by twelve patients. It seems to be chiefly the cases where much enlargement exists, for example, in chronic subinvolution.

In chronic corporeal endometritis unassociated with other lesions and classified as such, about 60% of the patients complained of back pain, mostly sacral, some lumbo-sacral.

Other Pelvic Conditions.

Prolapse of the ovary is sometimes a source of back pain; it is frequently lumbar and radiates to the ilio-inguinal region of the side affected. Enlargement of the ovarian and other veins probably has at times some causal effect in this condition.

Varicose veins of the pelvis are sometimes the cause of back pain of an aching character and explain the cause in many patients in whom no obvious lesion can be found. The veins in the base of the broad ligament and the ovarian veins are often involved.

Sometimes a diagnosis can be made by examination, sometimes by exclusion and deduction. Backache due to varicose veins of the pelvis is often associated with lumbo-ilio-inguinal pain and the ovarian veins will frequently be found engorged and varicose in these circumstances.

A minor degree of retroversion and subinvolution is often associated. High suspension of the uterus often gives relief with shortening of the utero-sacral ligaments. Sometimes actual local varicosities may be excised with benefit.

When removal of diseased adnexa is needed a wide excision, including much of the varicose area, is advisable.

Pendulous Abdomen.

The pendulous abdomen in which there is weakness of the musculature and sometimes separation of the recti with general abdominal ptosis, is often seen.

The clinical picture may be that of a woman well into the forties, multiparous, who has

increased much in weight and has deposited fat in the abdominal wall and omentum. The abdominal musculature becomes weak. She gets back pain from the drag on the viscera and abdominal wall. Overloading gives her foot deficiency and perhaps sacro-iliac strain and she has perhaps increased lordosis. But in thin women also pendulous abdomen frequently developes, commonly from separation of recti and a natural predisposition to general abdominal ptosis. In these cases plastic repair work on the pelvic floor when weakness occurs here, is often not followed by the amount of relief expected unless attention is also directed to the pendulous abdomen.

These conditions of pendulous abdomen and varicose veins of pelvis are, of course, commonest in women who have been several times through the strain and stress of child bearing. We might perhaps pay more attention to the care of women's abdominal muscles, not only during pregnancy but afterwards, for example, the wearing of suitable support during pregnancy for weak musculature and abdominal exercises to strengthen the musculature after the early puerperium. Many women will act on advice in this respect. Unfortunately, however, many consider that ordinary household duties, even if they consist chiefly in directing the maids, are more than sufficient exercise.

At modern schools some attention is paid to physical culture, but probably a few of the graceful gyrations of some Grecian dancing might well be replaced by well supervised abdominal exercises, to prepare for future stress and strain.

Fatigue and occupational backache is another condition often seen. It is due to long continued, faulty positions of the patient when at work or faulty deportment. It is often aggravated by chronic constipation and general ill health. A recent case is a good illustration: A girl of twenty-one years had become somewhat anæmic, her periods had become infrequent and scanty and she suffered with an aggravating backache. Regulation of her diet, correction of constipation and general treatment improved her menstrual functions and appearance, but her back pain did not disappear until an unsuitable stool upon which she sat and which forced her into a faulty position as regards her back muscles, was replaced by a suitable chair and change of desk. She was a book keeper.

The wearing of high heels may be mentioned here as in some cases disturbing the postural, muscular function and producing a fatigue backache. High heels of a moderate degree may not be a great sin, in fact some patients appear to benefit from the wearing of a moderately high heel, but it is indeed pathetic to see some people with a four or five inch heel with ground contact surface about the size of a shilling endeavouring to hobble along. Harmful effects in such cases cannot be long delayed.

Rheumatic conditions of the back whether associated with focal sepsis and toxæmia or with faulty metabolism, need merely be mentioned.

Coccygodynia is too well known to need more than mentioning, but we must pay due attention to the soft parts and referred pain and not rush to excision of the bone.

Sacro-iliac strain or disease is well known as a cause of sacral pain unilateral or bilateral. The joint is subject to traumatic, toxic and metabolic effects and trouble is indicated by pain and deep seated tenderness. In referred pain the tenderness is more superficial.

Suitable support in the way of a belt or special corset gives prompt relief in many cases. The wearing of a suitable belt might perhaps be more generally ordered after confinement, until the relaxed joints tend to involute.

A case representing the more general kind, in which lack of due consideration of various causes might easily lead to error is that of Mrs. H., aged fifty-two years, a *nullipara*, who complained of lumbo-sacral backache of three months' duration, worse on exertion. Her menopause took place three years before. She had recently noticed slight leucorrhœa. On examination a small but pouting high rectocele was discovered, as well as a cervical polyp and some slight erosion of cervix. The uterus was retroverted, small and mobile and there was no gross lesion of the adnexa.

The effect of spine movements and the great tenderness along various points of the vertebral column were suggestive. The patient was advised to have the cervical polyp removed, but was informed that her pelvic condition was probably not the cause of her back pain. X ray examination revealed signs of well marked osteo-arthritis with lipping of the vertebræ. This case is one in which gynæcological and orthopædic aspects had to be balanced and correct assessments made.

Mrs. S., aged forty-four years, a *multipara*, was admitted to the Sydney Hospital. She complained of sacral backache almost constant and also pain in the left lumbar region, extending down to the ilio-inguinal region. She had had abdominal section performed in another State eleven years previously and both tubes and one ovary, the left, had been removed. A plastic operation for a relaxed vaginal outlet undertaken eighteen months before admission had not relieved her pain to any great extent. The lumbo-abdominal pain had been constant with some exacerbations for tbout two years; her sacral pain had been present for six months and was getting worse recently.

Repeated pelvic examinations revealed only a normally placed uterus of about normal size and the right ovary *in situ*, not tender and apparently not diseased.

The patient was referred to Dr. Bridge for urological examination. Some narrowing of the ureter was dilated. Pyelography was carried out. This undoubtedly seemed to relieve her lumbo-abdominal pain, but her sacral pain persisted.

She began to have some pink discharge and menorrhagia and the uterus became tender. Laparotomy and hysterectomy were done chiefly at the patient's request and a submucous fibroid growth was found in the upper part of the uterus which no doubt caused uterine fatigue pain.

The last report some months after operation described her as being quite free from pain.

This is a mixed case, but illustrates the usefulness and necessity of investigation of the urinary tract when doubt exists.

Atresia of the cervix after curettage or plastic operations is rarely seen. The symptoms are chiefly colicky or labour-like pains in the lower part of the abdomen, but I have seen two patients with severe sacral pains and with mild lower abdominal pain. Bass, of Rostow, and Geinitz, of Stettin,

report cases. The former refers to twenty cases in a series of induced (legalized) abortions.

Because of the amenorrhœa some of these patients had been treated by organotherapy and other measures, the atresia not being diagnosed.

Mrs. T., aged thirty-four, a *nullipara*, also had an obscure condition. Sacral backache persisted for about two years and at times heaviness and discomfort in the rectum. The pelvic floor was normal, the uterus was retroverted, the appendages movable, not tender, but in the posterior fornix and close up behind the cervix was an indefinite induration, moderately tender, pressure upon which caused discomfort. Nothing abnormal was discovered on rectal examination. Eventually laparotomy and a modified Gilliam suspension were done for the retroversion; the tubes and ovaries were quite normal, but slight induration was present beneath the peritoneum of the floor of Douglas's pouch, with some dimpling of the peritoneum over it. There was no sign of diverticulitis of sigmoid and the diagnosis of adenomyoma or endometrioma was made.

It was subsequently noted that the onset and early part of each menstrual period aggravated her sacral ache and her rectal discomfort.

She still has her symptoms, but the local condition remains much the same four years after operation.

Still one more case which helps to show that the diagnosis of the cause of backache is not always simple.

Mrs. B., *ætatis* fifty-four, had lumbo-sacral backache most severe in the sacral region, radiating to the thighs; it had been present for about twelve months. On examination a large fibromyoma was found to fill the true pelvis; a diagnosis of pressure effects was made and laparotomy was undertaken for removal. The patient was to some extent relieved, mostly of the referred pain, but some months after operation she still complained of lumbo-dorsal back pain chiefly; it appeared to involve practically the lumbar and dorsal areas and was accompanied by a dull pain in the upper cervical spine as a later additional symptom.

The urine and blood pressure were normal. Investigation revealed that her husband had been tabetic and had died of arteriosclerosis. Blood examination gave a positive Wassermann reaction.

Specific treatment had a definite effect on her back pain, but for some months any remission of treatment on her part resulted in recrudescence of symptoms. At present she is much improved.

Other visceral causes of back pain will not be discussed, but I may state that the small intestine may be concerned in back pain in the lowermost dorsal and upper lumbar areas and the colon in the lumbar region and buttocks.

Under the heading of visceral causes it may be appropriate to refer to an interesting observation by Dr. Stanca, of Klausenberg, Roumania, in the *Zentralblatt fur Gynäkologie* (No. 15, 1927).

He found that, in the course of an operation for removal of the right tube and ovary under lumbar spinal anæsthesia, on clamping the infundibulo-pelvic ligament, the patient had a sharp stabbing pain in the scapular region. He found that manipulation of the mesovarium, the mesosalpinx, the serosa of the isthmial portion of the tube had the same effect.

The patient described similar effects but less severe on the opposite side; the impulse was by the sympathetic system and ultimately from dorsal centres to the intercostals, illustrating the production of high back pain from the ovary and tube. Irritation of the surface of the small cystic ovary had no effect.

He makes the interesting suggestion that it is the tubal irritation which accounts for Laffont's phenomenon of scapular pain in ectopic gestation and not merely the peritoneal irritation by escaped blood. Also that here may be an explanation of post-operative pain about the chest wall after certain pelvic operations, the condition leading sometimes to an unsuccessful search for chest complications.

Summary.

Back pain is frequently due to lesions other than gynæcological. It is quite frequently due to conditions of the spine and sacro-iliac joints, *osteoarthropathia ilio-sacralis et cetera*.

It is also frequently due to lesions of the renal tract.

Even with obvious existing gynæcological lesions, other systems should be carefully investigated. Static foot errors are fairly common as a cause.

In making the examination I have the following system:

The patient strips to the hips; her back is inspected for alteration of the normal curves. Tests are applied for tender points. The effects of movements are investigated, anterior, posterior, lateral.

All movements are aggravated in rheumatism, caries, sacro-iliac disease and muscle sprain and ligamentary sprain.

Anterior movement does not affect, but posterior movement aggravates disease of viscera and pendulous abdomen.

The feet are examined; the usual tests for sacro-iliac disease are applied. Pain in the costo-vertebral angle, radiating downwards, especially with urinary signs, indicates a possible renal lesion.

Sacral pain suggests pelvic visceral disease.

Careful pelvic bimanual and abdominal examination should be carried out. X ray examination must be added if there is any suspicion of a bone lesion or obvious pelvic lesion cannot be found.

A PRELIMINARY REPORT ON AN INTRADERMAL REACTION IN SCHISTOSOMIASIS.[1]

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THE incidence of urticaria and allied clinical manifestations in such helminthic diseases as hydatid, guinea worm, trichinosis and schisto-

[1] The reaction was demonstrated on bilharzia patients before a meeting of postgraduates held at the Walter and Eliza Hall Institute for Research in Pathology and Medicine, on November 7, 1927.

somiasis have led many observers to regard these phenomena as essentially anaphylactic in origin. Skin sensitization to worm extracts has, however, been actually demonstrated in comparatively few instances, the most outstanding examples being those reported by Casoni and Fülleborn.

Casoni[1] (1911) first introduced his cutaneous test in the diagnosis of echinococcosis, using carbolized filtered hydatid fluid as antigen. Normal saline solution was used as a control, the volume of each reagent being 0·5 of a cubic centimetre injected intradermally. Positive reactions were recorded in seven out of twenty-five cases of hydatid disease. Since that date laboratory and clinical investigations have led to improvements in the technique and interpretation of the test and in a large proportion of all subjects infested with hydatid cutaneous sensitization may be demonstrated. Two phases of the reaction, the immediate superficial wheal with pseudopodia-like outrunners and the delayed response characterized by diffuse erythema and puffy swelling of the deeper tissues, are now definitely recognized. In this country K. D. Fairley[2] (1923) and Kellaway, Dew, and Williams[3] (1925) have studied the reaction in a large series of clinical cases. Their results, while fully confirming the diagnostic value of the test, show that positive reactions persist for many years after complete elimination of all cysts.

Fülleborn[4] (1926) noted that in laboratory infections with strongyloides larvæ itchy urticarial wheals were produced at the site of their entry into the skin only in persons previously infested with *Strongyloides stercoralis*. Spontaneous anal wheals in strongyloides carriers were also observed to originate locally from reinfection with larvæ derived from the fæces. Fülleborn[5] (1926) next tested the cutaneous reaction to strongyloides antigen by inserting the dried powder into superficial scratches in the forearm and found wheals in 100% of persons harbouring larvæ of *Strongyloides stercoralis* in the fæces. One patient in whom strongyloides larvæ were absent, reacted positively and this patient gave a strong reaction to scurf extract (probably an instance of general skin allergy). Patients infested with strongyloides larvæ proved to be hypersensitive to ascaris powder and to a lesser degree to *Trichina spiralis* antigen as well. On the other hand the skin of patients harbouring *Ascaris lumbricoides* did not react to strongyloides antigen. A positive reaction to strongyloides antigen was regarded as probably indicating an existing intestinal infection.

Commenting on the general utility of cutaneous reactions in helminthic disease Fülleborn stressed the clinical importance of such a test, were it available in bilharzia and suggested that an antigen might possibly be prepared from bilharzia ova derived from urine, tissues *post mortem* or from experimentally infected animals.

In the present communication we wish to report the successful preparation of an anaphylactic antigen in schistosomiasis derived from the livers of snails infested with bilharzia cercariæ. The antigen for intradermal injection resembles that originally described by Fairley[6] (1919) for complement fixation reactions in schistosomiasis, but a filtered saline extract of the dried powdered livers is substituted for the alcoholic extract of the freshly dissected specimens.

The Group Nature of the Serological Reactions in the Bilharzia Diseases of Mammals.

The group nature of the complement fixation reaction in the bilharzia diseases of mammals has been emphasized by the work of Fairley, Cawston, Murray and other observers. Thus Fairley[6] (1919) showed that a cercarial antigen (*Schistosoma mansoni*) would detect both *Schistosoma mansoni* and *Schistosoma hæmatobium* in man and alternatively that a similar cercarial extract (*Schistosoma hæmatobium*) was an efficient antigen in the serological diagnosis of infestation with either or both of the Egyptian schistosomes. In India the same observer[7] (1926) found that cercarial extracts (*Schistosoma spindalis*) were equally efficacious in detecting *Schistosoma hæmatobium* in man or *Schistosoma indicum* and *Schistosoma spindalis* in goats. Cawston[8] (1921) in South Africa recorded that an alcoholic extract of the livers of *Physopsis africana* infected with the cercariæ of *Schistosoma bovis* acted as an efficient antigen for the serological diagnosis of *Schistosoma hæmatobium* and *Schistosoma japonicum* in man as well as of *Schistosoma bovis* in cattle.

Results of such uniformity indicate the presence in these extracts of a specific antigen common to all mammalian embryonic schistosomes which is capable of functioning in complement fixation reactions for the serological diagnosis of any species of bilharzia worm infesting bovines or man. This being the case it seemed to us not improbable on *a priori* grounds that a similar group reaction might occur with the anaphylactic antigens.

Standardization and Preparation of the Antigen for Intradermal Use.

The material employed in both the intradermal test and the complement fixation reaction about to be described was supplied by Lieutenant-Colonel F. P. Mackie, O.B.E., I.M.S., from the Haffkine Institute, Bombay.

It consisted of 1·06 grammes of desiccated livers derived from 180 snails (*Planorbis exustus*) infected with the cercariæ of *Schistosoma spindalis*.[1] The freshly dissected livers had been dried over calcium chloride in a desiccator under negative pressure and stored in sealed glass ampoules for dispatch to Australia.

As several months had elapsed since its preparation, deterioration of the antigen with loss of antigenic properties or development of pharmacologically active substances (histamine and allied bodies) had to be considered. The latter possibility was

[1] A cattle schistosome first described by Montgomery[9] (1906) in the portal system of *Bos indicus* in India. Liston and Soparkar[10] (1918) transmitted the infection to goats utilizing furcocercous cercariæ derived from local snails (*Planorbis exustus*). Fairley and Jasudasin[11] (1927) experimentally infected the Indian water buffalo and advanced reasons for regarding it as the chief definitive host.

disproved by Dr. C. H. Kellaway, who found that in strengths of one in fifty extracts similar to those used in the intradermal test possessed no stimulating action on uterine muscle preparations of the virgin guinea pig (Dale and Laidlaw,[12] 1912). The first possibility was investigated by making an alcoholic extract of the dry powder and estimating its antigenic properties by means of the complement fixation reaction. The actual experiment was as follows:

Ten cubic centimetres of absolute alcohol (99·8%) were added to 0·1 gramme of dried powdered cercarial livers. This 1% extract was thoroughly shaken by hand for twenty minutes and then incubated for twenty-four hours at 37° C. After being shaken again for a similar period it was centrifuged and the supernatant fluid was pipetted off and used as antigen. Preliminary tests indicated that a one in twenty dilution with saline solution (0·85%) was the optimum quantity of extract to employ. In the final experiment increasing doses of standardized complement (two to thirty minimum hæmolytic doses) in unit volume were put up in a series of tubes containing unit volumes of antigen (5%), saline solution and decomplemented serum (20%) derived from five goats experimentally infected with *Schistosoma spindalis*. The serum of goats not infected was tested simultaneously and appropriate serum, antigen and complement controls were included. After incubation of the system for one hour at 37° C. unit volumes of a 3% suspension of sensitized sheep's cells were added to each tube. Readings were made when all the controls had completely hæmolysed.

The results obtained are detailed in the accompanying Table I, a perusal of which shows that the extract fixed a considerable excess of complement (*id est* six to twenty minimum hæmolytic doses or more) in the presence of the serum of each of the five goats experimentally infected with *Schistosoma spindalis*, whereas the amount it deviated with normal goat's serum (Numbers 6 and 7) did not exceed two minimum hæmolytic doses either in this or other experiments. Such a result proved the point at issue, namely that these powdered cercarial livers still possessed definite antigenic properties *in vitro*. Incidentally it also afforded us an excellent antigen for the complement fixation tests which were subsequently performed on the serum of each patient in conjunction with the intradermal reaction. The source of the antigen employed in the two tests was thus identical.

The Intradermal Reaction in Man.

Some preliminary experiments with filtered as well as boiled saline extracts of the dried livers (*Planorbis exustus*) infected with cercariæ (*Schistosoma spindalis*) were made on hospital patients in order to determine the optimum strength of the extract and the quantity of fluid most suitable for intradermal injection. It was finally decided to adopt as a standard dose 0·25 cubic centimetre (four minims) of an 0·5% extract prepared as follows.

One-quarter of a gramme of dried powder is ground up in a mortar with fifty cubic centimetres of normal saline solution (0·85%) and the resulting mixture thoroughly shaken by hand. It is then incubated for one hour at 37° C., during which period it is again shaken periodically. Subsequently the extract is centrifuged, the supernatant fluid pipetted off and filtered through a Seitz filter (size 3) attached to a water pump. The filtrate consists of a clear amber-coloured fluid which is put up in ampoules in quantities of 0·5 cubic centimetre each and stored in the ice chest until required for use.

As no extract of normal snail livers (*Planorbis exustus*) was available to act as a control, two other control fluids were utilized. One consisted of normal saline solution, the other of hydatid fluid similar to that used in the Casoni reaction. These three fluids were used in separate syringes and injected intradermally in quantities of 0·25 cubic centimetre each whenever the test was being done.

While no bilharzia patient showed abnormal reaction to the control fluids, a reaction characterized by an immediate or an immediate and a delayed

TABLE I.—THE ANTIGENIC NATURE OF AN ALCOHOLIC EXTRACT OF CERCARIAL LIVERS TESTED AGAINST THE BLOOD OF EXPERIMENTALLY INFECTED GOATS (*Schistosoma spindalis*).

Number of Goat.	Experimental Infection.		Minimum Hæmolytic Doses of Complement.									
	Total Cercariæ Applied to the Skin.	Duration of Disease.	2	3	4	6	8	10	15	20	25	30
1[1]	117,500	132 days	+	+	+	+	+	+	+	+	±	O
2[1]	117,500	71 days	+	+	+	+	+	+	+	±	O	O
3[1]	117,500	71 days	+	+	+	+	+	+	+	O	O	O
4[1]	396,000	15 months	+	+	+	+	±	O	O	O	O	O
5[1]	100,000	17 months	+	+	+	+	±	O	O	O	O	O
6	Nil	Nil	+	O	O	O	O	O	O	O	O	O
7	Nil	Nil	O	O	O	O	O	O	O	O	O	O

+ = no hæmolysis; ± = partial hæmolysis; O = complete hæmolysis.
[1] At autopsy living schistosomes and spindle-shaped ova were demonstrated in large quantities.

response followed in the case of the cercarial liver extract.

In the immediate reaction the small circular wheal which had been produced by the intradermal injection, instead of remaining stationary or only slightly increasing in size, rapidly underwent a series of transformations. Within one to two minutes a reddish flush was noted in the surrounding skin and this rapidly increased in size and depth of colour until a zone of bright erythema several centimetres in width had been attained. Simultaneously the wheal grew outward, its peripheral extension being first indicated by an irregular area of discoloration and swelling of the dermis in its immediate proximity. As the latter zone increased in thickness, it whitened, becoming merged indistinguishably into the initial wheal which now resembled a giant amœba whose white pseudopodial outrunners contrasted with the scarlet flush of the surrounding skin. Maximum dimensions were generally attained in from twelve to twenty minutes by which time wheals of two to three centimetres diameter were encountered. Itchiness was sometimes complained of. After thirty minutes loss of definition occurred, the edges of the wheal became blurred and its size decreased. In an hour both the wheal and its surrounding zone of erythema disappeared in many instances. Early swelling of the deeper tissues at the site of the injection may sometimes occur at this period, but more frequently it developes later.

In the delayed type of reaction the arm presented an extensive puffy swelling of the subcutaneous tissues, so that the area involved became definitely raised above the general skin level from which it was separated by a defined edge. The skin over it was hot and very red, but only slightly tender. The patient may complain of a feeling of heaviness and tension in the limb, but never of actual pain. Enlarged axillary lymphatic glands were not observed. This phase of the reaction may be encountered in from three to twenty-seven hours following injection. One patient gave a history of widespread urticarial rash three days after the test was performed.

Analysis of Results in Patients with Bilharziasis.

Eight patients treated for schistosomiasis, four of whom had been infested with *Schistosoma hæmatobium* and four with *Schistosoma mansoni* as well, were tested. Of these seven gave an immediate reaction characterized by the rapid formation of a large irregularly shaped wheal two to three centimetres in diameter presenting outrunners and surrounded by a zone of florid erythema of variable dimensions. Generally the erythematous response was intense, bands four to eleven centimetres long and four to eight centimetres broad being observed. In one case (Number 6) little erythema resulted and it is interesting to note that despite this fact a well marked delayed reaction developed.

Observations on the delayed reaction were less detailed as the patients were not hospital in-patients. One did not return for examination and in several others it was possible to study the reaction only after an interval of twenty-four hours. In two such instances (Numbers 3 and 5) distinct erythema surrounded the site of injection twenty-four hours later, but swelling was absent, due probably to the fact that it had already subsided. One of the patients (Number 5) stated that this had happened. In three instances (Numbers 4, 6 and 8) well marked delayed reactions occurred and in Number 4 it was of so intense a nature that the greater part of the arm was involved. In all essential features this response closely resembled the delayed phenomena observed in the Casoni reaction.

Analysis of Results in Persons not Infected with Bilharzia.

Forty-seven patients in whom bilharzia infestation could be definitely excluded, were tested during the investigation, the criteria of a positive reaction being the rapid formation of a wheal not less than two centimetres in diameter characterized by outrunners and a surrounding zone of erythema.

All less extensive grades of reaction were ignored since observations on the Casoni reaction at this Institute have shown that small wheals may develope in normal people following intardermal injections. Only a wheal attaining the size of one shilling has diagnostic significance.

The results obtained in this series are epitomized in the accompanying Table II.

TABLE II.—THE INTRADERMAL TEST IN FORTY-SEVEN PERSONS NOT INFECTED WITH BILHARZIA.

Disease.	Positive Reaction.	No Reaction.	Total Tested.
Ordinary medical conditions	0	11	11
Ordinary surgical conditions	2	20	22
Hydatid infestations..	1	12	13
Ascariasis	0	1	1
TOTAL	3	44	47

Of the forty-four patients not reacting some showed no increase in the size of the wheal as laid down at the time of injection, but in others some increased whealing occurred. This was most evident in a patient with catarrhal jaundice in whom a wheal of 1·5 centimetre diameter and of strikingly yellow colour developed. The latter characteristic was, of course, due to the exudation of bile stained fluid from the superficial skin capillaries.

Of the three positive reactions observed in hospital patients one was suspected to be affected with hydatid disease, another had a fractured tibia, while the third suffered from some obscure pulmonary disease the diagnosis of which has not yet been made. The wheals attained a diameter of about

two centimetres in each case, but none showed any delayed reaction.

The patient with suspected hydatid disease gave a positive Casoni reaction and a history of having coughed up material like grape skins some twenty years previously, but as the test in twelve other patients with echinococcosis did not yield any reaction to cercarial antigen, cross reaction in an allied helminthic infestation was not considered a reasonable basis of explanation for the phenomenon.

Firm stroking of the skin with a bluntly pointed instrument for the local red reaction showed a triple response associated with swelling or whealing of the area stroked in the case of all three patients. They proved to be examples of factitious urticaria, a form of dermatographism which according to Lewis[13] (1927) is present in about 5% of healthy people. The normal response to firm stroking consists of a local red line confined to the area of pressure followed in fifteen to thirty seconds by a spreading flush or flare. Swelling and wheal formation over the line of the stroke, the third element in the response, is only exceptionally observed.

In performing the Casoni test Kellaway[14] (1925) has pointed out the care that is necessary to avoid pseudopositive reactions in patients with a tendency to urticaria and in view of our present observations any patient presenting the triple reaction to firm stroking described above should be definitely excluded as unsuitable for intradermal tests of this nature.

The injection of normal saline solution, though sometimes efficacious, proved inadequate as a control in these particular persons as in none of them did it produce wheals of abnormal dimensions.

The Basis of the Reaction.

When bilharzia cercariæ successfully penetrate the skin barrier during infestation of a host, some succumb *in situ* in the subcutaneous tissues, others are held up in the capillary bed of the lungs and perish there, while the more fortunate reach the portal system developing into schistosomulæ and finally into adult schistosomes which take up their normal habitat in the vesical, mesenteric and portal veins as the case may be. Fairley[7] (1926) has shown that in experimentally infested animals antibody appears in the peripheral blood as early as the seventh day of the disease and during the next few weeks the curve rapidly rises. Thereafter it gradually declines, flattening out to a lower and more uniform level which generally persists as long as the schistosomes survive.

During the first few weeks following invasion when much cercarial protein is being absorbed and the immunity response is at a maximum, there must be abundant opportunity for the tissue cells of the host to become saturated with antibodies. Such intracellular antibody persisting *in situ* long after the circulating antibody of the blood and the tissue fluids had declined would render the tissues potentially anaphylactic.

Dale[15] (1922) has shown that the seat of poisoning in anaphylaxis lies in the reacting tissue cells which in the case of skin anaphylaxis would be mainly the endothelial cells of its minute vessels. According to Dale anaphylaxis is due to the union of antigen and antibody within the cell itself with the production of histamine-like effects. Lewis[13] (1927) on the other hand holds that anaphylactic poison actually liberates "H substance" which causes dilatation and increased permeability of the fine vessels in the skin with local wheal production and reflex arteriolar dilatation accounting for the spreading erythema so characteristic of the local anaphylactic response. Either view would explain the phenomena observed in the immediate phase of the bilharzia intradermal reaction, provided the essential antigenic nature of cercarial extract be allowed.

The mechanism and time relationships of the delayed reaction in both the Casoni and this intradermal test are more obscure and further observation is required on this important aspect of helminthic anaphylaxis. It probably depends on an extensive vascular dilatation and increased permeability of vessels in the subcutaneous tissues, but whether this is directly caused by the slow diffusion of an antigen reacting over a wide area of tissue is uncertain.

The Clinical Value of the Test.[1]

The clinical value of any intradermal test depends on a high percentage of positive reactions in patients suffering from the disease in question and an absence of reaction in control cases. The present test undoubtedly fulfils the first of these criteria, but only experience of a large series of cases can determine its clinical limitations in the latter direction.

Excluding as demonstrably unsuitable for the test the three cases of factitious urticaria already referred to, no positive reactions were observed in the other forty-four hospital patients investigated. However, it may be found subsequently, as in the case of the Casoni reaction, that other conditions such as hæmophilia, jaundice and general skin allergy give rise to reactions of variable positiveness.

The existence of such pitfalls has not prevented the Casoni reaction from developing into a diagnostic test of great utility and judging by the results obtained in our preliminary series, this intradermal reaction should develope along similar lines. We are extending our observations and in the near future hope to compare the antigenic properties of dried cercarial infected livers with the desiccated schistosomes collected from the portal system of experimentally infected animals.

It will be noted that two of the treated patients, who were regarded on both serological and clinical grounds as cured, gave strongly positive intradermal reactions. Analogous results are obtained in the Casoni reaction after the complete eradication of hydatid cysts and all such tests can tell us is that at some period, recent or remote, the tissues have become sensitized to helminthic antigen. The bilharzia intradermal test is essentially of diagnostic significance and can afford no evidence as to the efficacy of drug treatment or cure.

[1] The reaction should have additional importance in Egypt in determining the essential relationship of Egyptian splenomegaly to previous bilharzia infestation.

The Complement Fixation Reaction in the Series of Cases Under Review.

Quantitative complement fixation tests were performed on sera derived from all eight bilharzia patients. A technique identical with that described earlier in this paper was utilized. An additional antigen prepared from an alcoholic extract of freshly dissected snails' livers (*Planorbis exustus*) infected with cercariæ of *Schistosoma spindalis* was employed.

The results obtained are detailed in Table III. It will be noted that the two antigens gave results of considerable uniformity and that strongly positive serological reactions were observed in five out of eight treated patients. The persistence of circulating antibody is well illustrated in one of these patients (Number 7) for records show that in Egypt in 1916 we stated his complement fixation reaction for bilharzia to be strongly positive and now eleven years later report a similar result. The test in the three other patients yielded negative results, their sera fixing less than three minimum hæmolytic doses of complement in the presence of bilharzia antigen.

With one exception the various treatments with tartar emetic epitomized in Table IV had been carried out several years previously. Generally the course fell short of the standard now advocated by Christopherson[16] (1923) who aims at administering two grammes intravenously over a period of four to five weeks. His index to cure consists of the absence of clinical symptoms and of living ova one year later.

Urinary examinations revealed no ova in all eight patients (Table III), but pus cells were noted in one specimen and red blood corpuscles in another. Perhaps different results would have been obtained if repeated examinations had been made and specimens had been collected after hard physical work.

None of the three patients manifesting serological cure gave a history of recurrent hæmaturia or dysentery, but four out of five of the patients with positive blood reactions had noted the occasional appearance of blood in the urine especially related to heavy physical work. In only one (Number 3) was the hæmaturia severe. The fifth patient complained of periodic attacks of abdominal pain and much loss of weight. Six patients had been examined by the cystoscope previously on several occasions; they were unwilling to be examined again. Even on clinical grounds there were reasons for doubting the completeness of cure in at least four of these patients and in view of the serological findings we have no hesitation in expressing the opinion that living schistosomes have survived treatment. The presence of antibody in the blood over periods of less than a year may not afford an index to the immediate efficacy of treatment, but where strong reactions are found several years later, it undoubtedly indicates the persistence of living schistosomes in the portal system of the host.

Fairley[17] (1926) showed at autopsy in experimentally treated animals which during life had been regarded as having been cured clinically that they sometimes harboured living schistosomes in the portal system. Here treatment had led to a permanent reduction in the number of parasites and to a great decrease in the ova content of the excreta. In some instances, especially where the female schistosomes were dominantly affected, eggs either failed to appear in demonstrable quantity or actually ceased to be deposited at all. Yet a moiety of antimony-resisting schistosomes survived and continued their parasitic existence, imbibing the venous blood and excreting the products of their metabolism into the portal vein of the host.

We classify four cases of the present series in a similar category. Their treatment from a public health point of view must be regarded as satisfactory, while clinically the vesical and colonic features have either cleared up or so decreased in intensity as to be only occasionally evident.

Notwithstanding none of these men look fit. They complain of both loss of weight and lack of physical reserve and in the absence of demonstrable ova in the excreta, diagnosis can be made only on serological grounds. In the assessment of the true cause of such disability the complement fixation reaction in schistosomiasis attains its maximum clinical value.

Summary and Conclusions.

1. A new intradermal skin test for schistosomiasis is described, the antigen being derived from the dried powdered livers of snails (*Planorbis exustus*) infected with bilharzia cercariæ (*Schistosoma spindalis*).

2. The reaction is characterized by the rapid appearance of a large white wheal two to three centimetres in diameter with pseudopodia-like outrunners and a surrounding zone of erythema. Delayed reactions are manifested by erythema, hotness of the skin and puffy swelling of the deeper tissues occurring three to twenty-four hours after the initial injection.

3. Seven out of eight patients who were or had been suffering from bilharzia (*Schistosoma hæmatobium*) contracted in Africa, gave immediate reactions. Three of them also showed responses of delayed type.

4. Out of forty-seven control patients forty-four failed to give reactions, while three gave immediate but not delayed reactions.

5. Each of these three positive control patients gave a triple response to the stroke test and in consequence any patient showing whealing on firm stroking is regarded as unsuitable for purposes of the intradermal test.

6. The test is exclusively of diagnostic value and does not afford any index to the effects of drug treatment. Reactions were given by two patients treated for bilharziasis who were regarded as cured both on serological and clinical grounds.

7. The value of the complement fixation reaction in estimating the endpoint of cure is discussed. The persistence of strong positive reactions several

TABLE III.—LABORATORY AND SEROLOGICAL DATA IN THE EIGHT PATIENTS TREATED FOR BILHARZIASIS UNDER REVIEW.

Case Number.	Period Elapsing Since Treatment (Years).	Total Course of Treatment (Grammes).	Ova Content of Urine.	Complement Fixation Reaction (Alcoholic Extracts).		Intradermal Test.	
				Moist Cercarial Livers.	Dried Cercarial Livers.	Immediate Reaction.	Delayed Reaction.
1[1]	7½	2·25	O	—	—	—	—
2	6¼	2·86	O	+ (15)	+ (9)	+	
3	1	2·0	O	+ (8)	+ (9)	+	E
4[1]	7½	1·38	O	+ (6)	+ (5)	+	+
5[1]	7½	1·08	O	—	—	+	E
6	7	1·23	O	+ (10)	+ (8)	+	+
7[1]	4¼	3·02	O	+ (8)	+ (5)	+	—
8	7½	1·92	O	—	—	+	+

[1] These patients were infested with both *S. mansoni* and *S. hæmatobium*; in the others only terminal spined ova had been demonstrated.
O = no ova in urine; + = reaction; — = no reaction; E = erythema. Figures in parentheses indicate the number of minimum hæmolytic doses.

TABLE IV.—CLINICAL FEATURES AND TREATMENT IN THE EIGHT BILHARZIA PATIENTS UNDER REVIEW.

Case Number.	Species of Schistosome.	Origin of Infestation.	Treatment with Tartar Emetic.				Clinical Condition Since Treatment.	
			Commencement.	Completion.	Number of Injections.	Total course (grammes).	Hæmaturia.	Renal Pain.
1	*S. mansoni* *S. hæmatobium*	Egypt (1916)	14/4/20	1/6/20	18	2·25	No	No
2	*S. hæmatobium*	South Africa (1901)	14/4/21 14/5/21 25/7/21	6/5/21 30/5/21 9/8/21	23 17 16	1·26 0·82 0·78	Yes	No
3	*S. hæmatobium*	South Africa (1926)	12/10/26	12/11/26	16	2·0	Yes	No
4	*S. hæmatobium* *S. mansoni*	Egypt (1916)	9/4/20	8/5/20	—	1·38	No	No
5	*S. hæmatobium* *S. mansoni*	Egypt (1916)	17/3/20	1/5/20	12	1·08	No	Yes
6	*S. hæmatobium*	East Africa (1916)	28/10/20	11/12/20	13	1·23	Yes	Yes
7	*S. hæmatobium* *S. mansoni*	Egypt (1916)	10/1/20 23/6/20 2/7/23	3/2/20 23/7/20 27/7/23	6 12 11	0·48 1·26 1·28	Yes	Yes
8[1]	*S. hæmatobium*	Egypt (1916)	25/3/20	9/5/20	—	1·92	No	No

[1] This patient had a relapse and ova were found in 1921; the patient states he had two further courses of treatment during the next two years, but this is not recorded in his file at Base Records.

years after treatment is recorded and in each instance the serological findings are regarded as definitely indicating the persistence of living schistosomes in the host.

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Reviews.

INVERSION.

"The Invert and his Social Adjustment," by "Anomaly" is the story of homosexuality from the pen of one of these unfortunately constituted individuals.[1] As the writer of the introduction states, "the author writes with the proverbial advantage of the wearer of a shoe in a discussion as to where it pinches." The author is not a medical man, but he is undoubtedly a scholar and capable of describing the mental make-up of the homosexual individual in a manner that satisfies the reader's desire for information on the subject. Medical men know or ought to know that the invert is such through no fault of his own. The author states further that the homosexual can be as pure morally as the heterosexual individual who is unable to gratify licit desires, the homosexual being able to sublimate quite as well as his heterosexual brother does. The author has written the book for the particular use of those who find themselves at a loss to provide practical advice for patients or penitents of confused sex. He also hopes that it may find its way into the hands of many persons to whom it may be a source of comfort and encouragement.

Information about the non-sexual temperament and other peculiarities of the invert make the book very interesting, because it is information that could be supplied only by one who understands the invert. The book is small enough to read in an evening and should be especially useful to the psychiatrist, family medical practitioner and State medical officer.

JOURNALISTIC FRAGMENTS.

EDEN AND CEDAR PAUL have collected and published in book form many of the essays, reviews and notes of Dr. William J. Robinson, editor of the *Critic and Guide*.[2] The title, "A Doctor's Views on Life" has been aptly chosen, for the book deals with life from almost every aspect.

Dr. Robinson has had an interesting and variegated career. He started to roam the world at an early age. He visited a number of cities, dwelt in various countries, gained a smattering of several languages and studied diligently whenever he had a chance. To the experiences gained during his roving days he attributes "two salient characteristics: a profound (perhaps morbidly intense) sympathy for the oppressed and downtrodden; and a fierce indignation towards all forms of injustice and cruelty." For a while he was a revolutionist. At the age of fifteen he was "entrusted with missions which the leaders hesitated to entrust to much older men." He lived for four years in Odessa. He subsequently went to America and became a pharmacist. He then acquired a "drug store" and found time to study medicine. In 1893 he graduated as Doctor of Medicine of the University of New York. He became a general practitioner, established a private college, the Board of Pharmacy Institute, which was granted a charter by the Regents of the State of New York, and then became a specialist in venereal diseases and dermatology. In 1903 he started the *Critic and Guide* and most of the articles in this book are reproduced from the pages of this journal. As is but to be expected, Dr. Robinson's varied life is mirrored in his writings. They are characterized by a breadth of outlook and sincerity of purpose. They are intensely human and therefore practical. The book is divided into several sections, "Birth Control," "War and Revolution," "Sexology," "Social, Political and Moral," "Medico-Social," "Books and Plays," "Psychoanalysis," "Character Types," "Miscellany," "Aphorisms and Fragments," "Travel Notes," "My Testament." This is a book which may be picked up at an odd moment and opened at any place. Each page holds the reader's interest.

[1] "The Invert and His Social Adjustment," by Anomaly, with an Introduction by Robert H. Thouless, M.A., Ph.D.; 1927. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 192. Price: 5s. net.

[2] "A Doctor's View on Life," by William J. Robinson, M.D.; Edited with a biographical introduction by Eden and Cedar Paul; 1927. London: George Allen and Unwin, Limited. Royal 8vo., pp. 526. Price: 16s. net.

The Medical Journal of Australia

SATURDAY, DECEMBER 10, 1927.

Membership of the British Medical Association.

THE Queensland Branch of the British Medical Association has recently had under consideration the question of the defects attaching to the election of members to the British Medical Association and the transference of members from one Branch to another. The Western Australian Branch has also dealt with the same subject. As a result of these deliberations the Federal Committee was asked at its meeting in September of this year to take steps to remedy the existing anomalies. The committee resolved to request the Council of the British Medical Association to amend Article XVII, as far as it applies to overseas Branches. According to the constitution any medical practitioner registered in the United Kingdom or registered to practise in any part of the British Empire is eligible for membership. Formerly it was necessary for an applicant for membership to obtain the signatures of members of the Association to a certificate that the applicant is a suitable person to be elected. A certificate is now required by five Branches in the United Kingdom and by four overseas Branches, including the New South Wales Branch. Once a medical practitioner is admitted as a member to the British Medical Association, he is *ipso facto* a member of the Division or Branch in the area of which he resides. Occasionally a member seeks to retain his membership of a particular Branch after he has taken up his residence in the area of another Branch. According to the Article XVII even temporary residence in the area of a Branch renders his transfer to that Branch automatic and obligatory.

Since 1922 the overseas Branches of the British Medical Association have been empowered to become incorporated under local legislation as companies "not for profit," provided that they adopt a special memorandum of association drafted for the purpose and a constitution in keeping with that of the parent association. It will be remembered that powers were also given to the overseas Branches to form federal councils which could also be incorporated in a similar manner. At the present time each Branch of the British Medical Association in the Commonwealth can elect members in accordance with its rules. One Branch may demand a certificate of fitness to be signed by two or three members; another Branch may dispense with all inquiries and admit any applicant not known to be unsuitable. It will be seen that the precautions taken by one Branch may be rendered nugatory when a member of a neighbouring Branch changes his residence and is automatically transferred to it. The proposal of the Queensland Branch of demanding of all applicants for membership information in the form of replies to a *questionnaire* would undoubtedly remove some of the difficulties that obtain at present. The alternative proposal that no member should be transferred *ipso facto* when he moves his residence to a place within the area of another Branch, has the disadvantage that the Imperial character of the association would be endangered if it were applied. As long as a member elected to the British Medical Association under the existing articles has the right to retain his membership no matter where he resides, it would obviously be unfair to a member arriving from the mother country to expose him to the risk of exclusion from a Branch in Australia in the area of which he may take up his residence. It seems to us that the remedy lies in the introduction of stricter rules governing admission which should be uniform throughout the Commonwealth. The time appears to be approaching when a federal council will be set up and given reasonably wide powers. Would it not be a proper function of a federal council to receive all applications for admission to membership of the British Medical Association within the Commonwealth? The federal council could institute the necessary inquiries through the Branches concerned before election. If membership were refused after adequate inquiry, the individual would be unable to gain entrance by seeking a new Branch. The *questionnaire* could be used as a convenient method of

collecting information concerning an applicant. Guidance could be obtained from those with personal knowledge of the applicant and from the experience of those with whom the applicant has come into contact.

If a member of the British Medical Association residing in any part of Australia were deemed to be unfit to retain his membership, this could be determined in accordance with the Articles and By-Laws of the British Medical Association. No individual may be deprived of the privileges of membership save for the reasons defined in the constitution as grounds for expulsion. It would be unjust and irrational to allow the continuation of membership to be jeopardized by such things as unpopularity, personal peculiarity or heterodox views. On the other hand unethical behaviour, conduct calculated to bring the medical profession or the British Medical Association into disrepute or the commission of actions that are punishable by law are adequate reasons for expulsion from the association. The rules for expulsion exist in every Branch and these rules must be applied without fear or favour, in order that the dignity and authority of the British Medical Association may be maintained. It might, perhaps, be advisable to require the future federal council to be the final court when the question of expulsion from the association is at issue.

Current Comment.

THE MONOCYTES IN TUBERCULOSIS.

In February, 1926, reference was made in these columns to work by Cunningham, Sabin, Sugiyama and Kindwall on the monocytes in their relationship to tuberculosis. These observers hold that tuberculosis is "a disease of the monocytes," that these cells are damaged by the tuberculous infection and that they subsequently act as nests for the tubercle bacilli. It will be remembered that they distinguish sharply between monocytic and clasmatocytic phagocytes. They believe that the clasmatocytes are derived from endothelium and constitute the so-called endothelial phagocytes, the endothelial leucocytes, and that the monocytes arise in common with the other white cells from the primitive reticular cell. This view, however, is not that which is held by all hæmatologists. Thus Gulland and Goodall in their well known text book state that the whole of the hyaline series—large lymphocytes, small lymphocytes, large mononuclear cells and the so-called transitional cells—belong to one class. The same view was advanced in a Harvey lecture, delivered in December, 1925, but published this year, by Warren H. Lewis.

In February of this year P. A. Lewis and E. S. Sanderson reported the results of some experiments in which they noted the reaction in the lungs of rabbits to which they had given intravenous injections of both human and bovine tubercle bacilli. They found that the large mononuclear type of cell is most clearly related physically to the tubercle bacilli without distinction as to bacillary type They concluded that cells of this type undoubtedly "stand in a central position in any picture of experimental tuberculosis of the rabbit." At the same time they could not overlook the part played by polymorphonuclear leucocytes. They thought that possibly these cells are a response to the living tubercle bacilli as contrasted with either the dead bacilli or the living bacilli segregated in mononuclear cell clusters or in tubercles.

The experiments of Lewis and Sanderson have recently been repeated by F. R. Sabin and C. A. Doan.[1] They have used rabbits and have injected them with the bovine strain of tubercle bacilli only. They examined tissues at intervals of twenty-four hours for the first four days and every forty-eight hours thereafter throughout the acute reaction of the first month. They used the supravital technique and studied before fixation tissues of the lungs, liver, spleen, mesenteric lymphatic glands, omentum and bone marrow. Twenty-four hours after the injection of the bacilli no increase in the free cells obtained from the scraping of the cut surface of the lung could be detected. As in the normal, the free cells were largely of two types, clasmatocytes and monocytes. Occasionally true epithelioid cells were present. The same cells were found at the hilum of the lung. Polymorphonuclear leucocytes were present only in normal percentage of the circulating blood. After two days there was an increase in free cells and this increase was largely due to clasmatocytes. Some primitive cells and monoblasts, many young monocytes, an occasional epithelioid cell and lymphocytes were present. At seventy-two hours there were many more small lymphocytes, but the clasmatocytes still predominated in the large mononuclear group. Examination of stained sections of fixed tissue revealed the beginning of tubercle formation. On the fourth day the reaction had become predominantly monocytic. Many young monocytes were found together with epithelioid cells and typical giant cells of the Langhan's type. Clasmatocytes loaded with *débris* were still numerous. From the sixth to the eighteenth day there was a progressive consolidation with epithelioid and giant cells. There were always present many young monocytes and these were regarded as the source and origin of the increasing epithelioid cells. Clasmatocytic scavengers were

[1] *The Journal of Experimental Medicine*, October 1, 1927.

constantly present. It is not necessary to describe in detail the changes in the other organs. They were invariably noted later than those in the lungs. Changes were noted in the liver on the sixth day, in the spleen and in the lymphatic glands on the fourth day. The late development of tubercles in lymphatic glands is regarded as indirect evidence against the normal presence of monocytic foci in these glands. Sabin and Doan then proceed to discuss these findings and to analyse them in terms of the activity of monocytes and clasmatocytes. They are in reality reiterating what was previously concluded by the group of which Sabin is a member —that the immediate major response of the connective tissue to tuberculous infection involves two strains of cells, clasmatocytes and monocytes. The clasmatocytes are the macrophages of the general connective tissues and respond to the presence of large numbers of tubercle bacilli as they do to any other *débris* or foreign material, phagocytizing and fragmenting them. There is also evidence that in this process many clasmatocytes are themselves destroyed. Acid fast *débris* is found in the clasmatocytes. The monocyte, on the other hand, is so influenced by the infection that it becomes a cell of the typical epithelioid type and eventually forms the characteristic lesion of the disease. The tubercle bacilli remain in the epithelioid and giant cells and apparently can survive over long periods of time. The fact that the epithelioid cell appears in the lung within twenty-four hours of injection of the bacillus is correlated by Sabin and Doan with the observation that numbers of mature monocytes are at all times to be found in the normal lung. In short, it may be stated that Sabin and her group of workers believe that the monocytes and clasmatocytes differ in regard to derivation, structure and function. W. H. Lewis opposes this view; he belongs to what may be called the monophyletic school, of which Maximow is an ardent supporter.

First of all in regard to derivation of these cells, those who hold the monophyletic view, believe that all the blood cells arise from the primitive blood cell. Clasmatocytes, monocytes and epithelioid cells are then merely different phases of the same cell type. Lewis holds that the transformation of mononuclear cells into macrophages, epithelioid cells and transition forms cannot be considered as a true differentiation into new and fixed types of cells, but that the different forms are temporary functional variations of the same cell type. The difference in appearance according to him depends to a large extent on the amount and character of the ingested material. Thus structural appearance depends on function and differences in staining properties will result. Macrophages (clasmatocytes) can take on epithelioid characters and epithelioid cells can under certain conditions become macrophages. Lewis refers to Sabin's claim that she was able to see clasmatocytes arise directly from the endothelium by mitotic division of the endothelial cells of the capillaries and to her view that cleavage occurs when the plane of division is such that one of the daughter cells projects either outside the capillary wall or into the lumen. Lewis "cannot conceive" of a simple flat endothelial cell dividing first into a clasmatocyte and an endothelial cell and later perhaps into a primitive red blood cell and an endothelial cell. He thinks it likely that the cells which Sabin interpreted as arising from the endothelium, were merely mononuclear cells which had become adherent and more or less flattened out on the endothelium where they divided. In view of the fact that Sabin and Doan have experimented with rabbits, it is interesting to note that McJunkin differentiates three types of monocytes; first, phagocytic cells, monocytes that are formed in the bone marrow and spleen; second, lymph-endotheliocytes which are derivations of the reticulo-endothelium of the lymph glands; third, hæmo-endotheliocytes which probably arise from the endothelium of the blood vessels and occur in the blood of rabbits, but are absent from normal human blood. As far as derivation of the cells under discussion are concerned it must be remembered that both clasmatocytes and monocytes are the product of the multipotent mesenchyme cell and that the possible share taken by the reticulo-endothelial system must not be forgotten. The various schools of thought are not really so divergent as they appear.

It is not intended to refer in detail to the points raised by these authors in regard to the structure of the cells under discussion. One must suffice. Lewis has pointed out that vacuoles arranged as a rosette around the centrosphere may be observed in the clasmatocyte as well as in the monocyte. Sabin and Doan admit that this is true. They point out that the arrangement of granules around the centrosphere of granulocytes is a transient stage in the development of the leucocyte and that this phase is seen in blood whenever prevailing conditions bring less mature leucocytes from the bone marrow. In living cells taken directly from the animal a rosette formation is the exception for the clasmatocyte and the rule for the monocyte and in the epithelioid cell the rosette formation of neutral red bodies becomes the constant chief morphological characteristic of the cell. Most writers on this subject lay much emphasis on the action of the blood cells on invading organisms such as the tubercle bacillus. It is not unlikely that many of the divergent appearances may be interpreted in terms of the effect of the organism on the cell. The phagocytic clasmatocyte has overcome the organism and destroyed it. The monocyte has absorbed it and after absorption the organism influences the monocyte as Sabin and Doan point out "to become the typical epithelioid cell." Here function is so bound up with structure that the two cannot be considered apart from one another. All observers are agreed that the monocytes play a prominent part in tuberculosis and the observations of Sabin and her collaborators justify them in describing the condition as "a disease of the monocytes." The fact that monocytes are found normally in the lungs more than in any other tissue accounts for the early pulmonary changes described by Sabin and Doan.

Abstracts from Current Medical Literature.

GYNÆCOLOGY.

Uterosalpingography.

JULIUS JARCHO (*Surgery, Gynecology and Obstetrics*, August, 1927) reports his experience of radiological visualization of the cavity of the uterus and Fallopian tubes after injection of iodized oils. He claims that it furnishes a valuable means of exact gynæcological diagnosis in selected cases. In cases of sterility the procedure gives information as to whether the tubes are patent or not and also localizes the site of the occlusion. It not only supplements the insufflation of gas, but often supplants it. The technique is simple, but strict aseptic precautions must be taken. The author is firmly opposed to the performance of the test on ambulatory patients. Properly performed, the test outlines the uterus and the various portions of the Fallopian tubes with great distinctness. Proper interpretation of the X ray findings requires experience. In some cases it is advisable to examine plates exposed at successive intervals or from different angles. In the author's experience the intrauterine injection of iodized oil is entirely safe and harmless and no manifestations of iodism have been observed.

The Action of Pituitary Extract and of the Ergot Alkaloids.

ALECK BOURNE and J. H. BURNS (*Journal of Obstetrics and Gynæcology of the British Empire*, Summer Number, 1927) record the results of an investigation carried out for the Medical Research Council and for the Pharmaceutical Society of Great Britain into the dosage and action of pituitary extract and of the ergot alkaloids on the uterus in labour. Pituitary extract has been standardized by an international conference convened by the League of Nations at Geneva and after August, 1927. The adoption of this standard will be compulsory for all preparations. The strength is stated in units, one unit being defined as the amount of activity present in 0·5 milligramme of the standard extract adopted by the conference. After August, 1927, all preparations of pituitary extract will be labelled in units and in order to give a particular number of units the practitioner must measure the appropriate number of cubic centimetres or minims. Thus a dose of two units is contained in 0·2 cubic centimetre (3·5 minims) of a preparation which contains ten units per cubic centimetre. A rubber bag in the form of a hollow disc 3·4 centimetres (one and three-eighths inches) in diameter was inserted 20 centimetres (eight inches) above the *os uteri* between the uterine walls and the membranes and connected to a recording apparatus. Tests were made during the first and second stages of labour. The authors conclude that a dose of two units may be expected to produce an effect which should be useful in hastening the course of a sluggish labour, provided that it is not administered before the *os* is about one-half dilated. A dose of two units may be given with safety at any stage provided there is no mechanical obstruction. The least interval at which any dose can be usefully repeated is one hour, but often the effect of two units has lasted longer than this. The action of the separate ergot alkaloids has been examined. It has been found that tyromine has no value in obstetrics. Histamine in a dose of 2·0 milligrammes, when injected under the skin, has a powerful but short-lived effect; it appears to exhaust the uterine activity. The specific alkaloid of ergot (ergotamine or ergotoxin) exerts a very prolonged action and appears to be an ideal agent for use after delivery. It is noted that *extractum ergotæ liquidum* (British Pharmacopœia) does not contain the specific alkaloid and in view of the authors' results can have no therapeutic effect.

Acute Gonorrhœal Salpingitis.

ALECK BOURNE (*Journal of Obstetrics and Gynæcology of the British Empire*, Summer Number, 1927) in discussing the treatment of inflammatory conditions of the uterine adnexa, states that he regards an acute gonorrhœal salpingitis as the terminal phase of a complex pelvic infection. The tube may be easily removed, but ill health is derived from the infection of the uterine body and cervix. He considers that operation during the early acute stages of pelvic peritonitis should be decided by the severity of the attack. The patients with mild "catarrhal" conditions should not be submitted to operation. A patient with severe suppurating salpingitis, who complains of severe pelvic abdominal pain, vomiting and uterine hæmorrhage and who has a temperature of 39·4° C. (103° F.) and a pulse rate of 120 should be operated on or she will become an invalid from a chronic pelvic lesion. He holds that the most suitable operation is salpingotomy, but great care should be taken not to leave a Fallopian tube which can obviously never perform its function. During convalescence the uterus should be treated by frequent injections of glycerine and protargol. After convalescence final assurance should be made that the cervix and urethra are free from gonococci.

The Cancer Problem in Gynæcology.

WILLIAM P. GRAVES (*Journal of Obstetrics and Gynæcology of the British Empire*, Summer Number, 1927) reviews the present position of the cancer problem in gynæcology. He concludes that in the light of modern knowledge the struggle for the control of cervical cancer must be directed not alone to measures for the cure of existing disease, but preeminently to a systematic prevention of those irritative conditions, the long continued action of which leads to cancer. There is clinical evidence that cancer of the uterine body is simulated by imperfect genital drainage. Theoretically, many such cancers may be prevented by a surgical prophylaxis, that insures proper drainage of the parts. There is theoretical and clinical evidence that the cancerous change of most malignant ovarian cystomata is a late development in tumours originally benign and that it is produced by the pressure and chemical irritation of the pent-up contents. Cancer of the vulva may be stimulated by irritating secretions that are produced by gynatresic, ulcerating or inflammatory processes higher up in the genital tract.

Benign Uterine Bleeding.

J. VINCENT MEIGS (*American Journal of Obstetrics and Gynecology*, August, 1927) furnishes a preliminary report on a series of patients who suffered from benign uterine bleeding and who were observed at the Massachusetts General Hospital during three years. Instances have arisen that seem to suggest that some patients with hypothyreoidism or myxœdema may have longer menstrual periods than normal and that in consequence of a poorly functioning thyreoid ovarian hypersecretion may occur with consequent menorrhagia. Destruction of the hypersecreting ovary may show the picture in its true light, disclosing a real myxœdema. In some instances uterine bleeding in young girls has been held in check by the use of thyreoid extract and extract of the *corpus luteum* and in the condition of one patient hyperpituitarism or hypopituitarism was apparently the causal factor. It seems to be definitely established that patients with hyperthyreoidism often have oligomenorrhagia or amenorrhœa and that removal of the hypersecreting gland may cause the menstrual cycle to return to normal. It appears to be definitely established that true thrombopenic *purpura hæmorrhagica* is a cause of excessive uterine bleeding and that there is a group of patients with excessive uterine bleeding who present slight variation from the normal blood picture, who give a history of petechiæ or black and blue spots and who possibly have a palpable spleen. Benign menorrhagia and metrorrhagia also result from other causes besides those associated with the ovary and uterus.

Myomectomy and Sterility.

J. BRIGHT BANISTER (*Proceedings of the Royal Society of Medicine*, August, 1927) reports five cases in which myomectomy was undertaken on account of sterility and one in which this operation was performed after fibroid tumours had brought about an abortion. The number of tumours removed from each patient varied from one to seventeen. The sterile patients had been married for periods varying between four and ten years. In every instance pregnancy resulted. Two of the patients had previously been advised not to submit themselves to operation. The author points out that the presence of fibroid tumours has been regarded by some as a cause

of the infertility of the patient, but that other authorities hold the view that the fibroids have developed because the patient has had no children. Even if a woman conceives and bears children after an operation for removal of a fibroid tumour, there is no evidence that such operation has produced a more favourable local condition. He holds that the series of cases reported by him tends to show that there is some justification for the operation of myomectomy when it is undertaken for no other reason except that the patient is either sterile or has had repeated miscarriages.

OBSTETRICS.

Diet Control in Pregnancy.

J. M. SLEMONS and R. H. FAGAN (*The American Journal of Obstetrics and Gynecology*, August, 1927) have studied regulation of the diet of four hundred and forty-four pregnant women and the effect of this regulation upon the birth weight of the infant. The patients were recommended to drink water freely, to eat frequently, to take no heavy meals and after the "quickening" to take no cream and to drink milk sparingly on account of the fattening tendency of these two articles of diet. A mixed diet of two thousand calories, containing all the proper physiological requirements, was prescribed. A gain of 6·8 kilograms (fifteen pounds) in the mother represents the increase due to the products of conception; anything over and above that is due to actual increased body weight. The results of the observations are tabulated and they show that there is a relationship between the increase of the mother's weight during pregnancy and that of the child at birth. A source of error in the observations is the possibility that some of the patients neglected the instructions. Diet control does not provide a means of regulating accurately the weight of the infant, but it offers the only method at our disposal of influencing the size of the fœtus and preventing over growth. It is also of great value in preventing maternal toxæmia.

The Duration of Labour.

A. OSTRČIL (*Wiener Medizinische Wochenschrift*, July 16, 1927) refers to the modern demand for rapid and painless delivery. Attemps at analgesia have been made with morphine and scopolamine and also with rectal ether narcosis, but he maintains that pain can be best controlled by shortening the duration of labour. In his hands this has been attained by early rupture of the membranes whenever the cervical canal is obliterated, by manual dilatation and the intravenous administration of small doses 0·12 to 0·18 mil (two to three minims) of pituitary extract. He has treated in this manner one hundred and fourteen *primiparæ* and fifty *multiparæ*. In *primiparæ* labour was completed in three hours when the *os* admitted two fingers; at later stages the time rapidly diminished until when full dilatation was present it only took forty minutes. *Multiparæ* under similar conditions were delivered in periods varying from sixty to twenty-five minutes. There was no maternal nor fœtal mortality. Occasionally some uterine atony was observed in the third stage, but this was controlled by further injections of pituitary extract. Despite his success with this method the author opposes its use by the general practitioner and would reserve it for the specialist. The method should be employed in normal cases only.

Toxæmias of Pregnancy.

H. A. MILLER and D. B. MARTINEZ (*The American Journal of Obstetrics and Gynecology*, August, 1927) make a preliminary report of the use of liver extract in fifty cases of toxæmia of pregnancy in order to draw attention to the method and aid an appraisement of its value. The extract used was free from histamine and had no effect on the uterus of the virgin guinea pig. Patients who had nephritis, received only symptomatic benefit. Convulsions did not occur in patients in the preeclamptic state. It is considered that the drug neutralized the "toxin" in eclamptic patients.

Intravenous Injection of Glucose.

P. TITUS and P. DODDS (*The American Journal of Obstetrics and Gynecology*, August, 1927) discuss the causes and the means of prevention of the reactions which have been reported to follow the injection of glucose solution. The reactions take the form of a sharp chill, rise of temperature, shock and occasionally collapse and even death. The reasons for these reactions are impurities in the glucose, contamination of the distilled water, improper preparation of the apparatus and improper administration, the solution being too hot or too cold or too weak or being administered at too fast a rate. The authors recommend the use of a 25% solution in doubly distilled water and not in saline or sodium bicarbonate solution. The water must be freshly distilled and only glassware should be used which has been recently washed in distilled water. The rubber tubing used must have been washed in running water, boiled in clean water and finally sterilized in an autoclave in order to avoid any sediment from the water settling in the tubing. The purest glucose is necessary and it must be kept in glass containers; ampoules are recommended, provided that no preservative has been used in the preparation. The authors recommend that an initial dose of seventy-five grammes should be administered and that this be followed by doses of fifty grammes. Repeated sterilization of the solutions may cause caramelization and alterations in the concentration, hence each solution must be freshly prepared. A 10% solution is considered as the lowest strength advisable and should be used only when a larger amount of fluid is required to be injected.

Vaccination and Pregnancy.

B. G. LIEBERMAN (*The American Journal of Obstetrics and Gynecology*, August, 1927) has investigated the question of vaccination of the pregnant woman with a view to conferring immunity upon the fœtus. Three hundred and fifty-one women were vaccinated on admission or on presenting themselves at the antenatal clinic and the infants were vaccinated on the first day as a routine procedure. In spite of some severe local reactions in the mother none of the infants appeared to be adversely affected. It was found that vaccination of the mother does not convey any specific immunity to the infant. Any immunity which the infant may possess, is probably due to the general immunity of the newborn and is not sufficient to afford protection. Women may be safely vaccinated at any time during pregnancy and the infants may be vaccinated with safety on the first day.

Involution of the Uterus Post-Partum.

JOHN H. TEACHER (*The Journal of Obstetrics and Gynæcology of the British Empire*, Spring Number, 1927), holds that a knowledge of the macroscopical and microscopical appearances of the uterus at various periods *post-partum* is not only necessary for a proper understanding of the process of involution in obstetrics, but may be of great importance in medico-legal problems. In normal circumstances and even in the presence of grave constitutional or slight local disease involution probably progresses at a regular rate. Retention of some parts of the product of conception causes the greatest disturbance of the healing process and delays results. The most reliable information may be obtained by examination of the mucous membrane of those parts of the uterus which have been covered by the *decidua vera* and by examination of the placental site. During the first week there occurs a demarcation of tissues which are to perish. Retrogression of the surviving decidua and reactive proliferation also occur during this period. In the second week cleansing and restoration advance rapidly and by about the fourteenth day the formation of a provisional mucous membrane is normally complete. The author describes a series of cases from which he draws his conclusions, and illustrates his article with a series of photomicrographs. He points out that there is a striking analogy between the process of involution and that of a wound healing by granulation in the presence of sloughs and micro-organisms. The fourteenth day is the point at which building up of the tissues definitely exceeds retrogression. At the end of three weeks, however, the process of restoration is still far from complete. Although at five to six weeks restoration should be moderately complete, evidence of recent pregnancies may be found for a considerably longer period. This evidence consists in the presence of pigmented phagocytes and of remains of the utero-placental vessels.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH COMBINED WITH MEETINGS OF THE SECTION OF ORTHOPÆDICS AND THE SECTION OF OBSTETRICS AND GYNÆCOLOGY was held at the B.M.A. Building, 30 to 34, Elizabeth Street, Sydney, on October 27, 1927, DR. S. A. SMITH, the President, in the chair.

Welcome to the President.

DR. ANDREW DAVIDSON welcomed Dr. S. A. Smith on his return from his travels abroad. He trusted that he had spent the time in a pleasant and profitable manner and assured him that the members of the Branch rejoiced to see him in the chair.

In acknowledging the welcome, Dr. S. A. Smith referred to the admirable manner in which Dr. Brown Craig had carried out the duties of President during his absence. The Branch was to be congratulated because its affairs would be in Dr. Craig's hands for eighteen months, a preliminary period of six months and after the annual meeting a further period of twelve months.

Low Back Pain.

DR. D. J. GLISSAN read a paper entitled: "The Orthopædic Aspect of Low Back Pain" (see page 803).

DR. C. V. BOWKER read a paper entitled: "The Gynæcological Aspect of Low Back Pain" (see page 808).

DR. RALPH WORRALL said that the impression he had received from Dr. Glissan's excellent skiagrams and from his description of the changes in the bones was that the lesions were in the majority of the patients irremediable. He was convinced that it was unwise to apply plaster cases unless the indications were very definite. He particularly disapproved of plaster cases for young girls He had recently seen two young girls encased in plaster whom he would not have treated in this way. It might be that the treatment was the lesser of two evils. There was nearly always much weakness in both lower extremities in these patients. He agreed with Dr. Bowker that low back pain was usually not due to gynæcological conditions nor to disease of the viscera. The cause was either in the muscles or in the bones. It behoved them to take a broad view of these cases and to exercise the utmost caution in ascertaining the real cause before applying any form of treatment.

DR. N. D. ROYLE said that Dr. Glissan had omitted to mention one important cause of low back pain. Faulty posture in the recumbent position acted frequently. It was necessary to examine the bed in which the patient slept. A sagging mattress with but little support often led to relaxation of the sacro-iliac ligaments and thus to backache. The pain disappeared if the patient were made to sleep on a spiral spring mattress. It was significant, as Dr. Worrall had stated, that there was often evidence of sacro-iliac strain without any pain that could be referred to gynæcological conditions. He was convinced that sacro-iliac relaxation was the commonest cause of backache. Dr. Royle exhibited a rubber belt devised by himself which he applied midway between the trochanters and the anterior superior spines of the ilium. He had had excellent results from this belt. It should be tried before any operation was considered.

DR. L. G. TEECE spoke of trauma as a cause of low back pain. He warned practitioners not to be misled by the mildness of the injury. The degree of violence was no index of the amount of damage produced. By planning a systematic examination and carrying it out with care it was often possible to detect malingering. The apparent limitation of spinal flexion often disappeared when the patient stooped to pick up his trousers. The most valuable sign of the genuine nature of a condition was a unilateral involuntary muscle spasm of the *erector spinæ* muscle in the lumbar region. Dr. Teece could not agree with Dr. Glissan that fractures of the transverse processes were always caused by direct violence. Within the past few months he had seen three patients who had sustained this fracture as a result of extreme muscular efforts. He had even known a compression fracture of the body of a lumbar vertebra to result from muscular effort alone. Injuries of the sacro-iliac joint of any degree of severity were always found to result in wasting of the thigh of the same side and were often accompanied by pain and tenderness in the course of the sciatic nerve. In the treatment of these injuries rest was essential, but the back should not be placed on a flat surface. It was necessary to preserve the normal forward curve of the lumbar spine. X ray examination was not always reliable. He had once inserted a massive bone graft into the sacro-iliac joint in a case of traumatic subluxation and in a skiagram taken some weeks later the graft could not be seen. It was obvious therefore that gross pathological changes could exist in a sacro-iliac joint without being detected by the X rays.

DR. A. C. ARNOLD said that he had seen an extrusion of synovial membrane in sacro-iliac strain similar to that of ganglion of the wrist. He asked Dr. Glissan what treatment he would advise. He had been disappointed that Dr. Glissan had not mentioned refrigeration as a cause of low back pain. Men working in hot places, such as mines, often wore flannel belts which became sodden with sweat. When the men went home, the cold, wet belts chilled the skin and backache resulted. The remedy was either to avoid wearing the belt or to change the belt before leaving the hot atmosphere. He had noticed that many patients with low back pain had a subnormal temperature, often about 35·5° C. (96° F.). If these patients were warmed by taking one or two tablespoonfuls of olive oil after meals till the temperature rose to normal the pain disappeared. Low back pain was also caused by constipation in young girls. It was necessary to stop strong aperients and to regulate the bowels by hygienic means and proper dieting. The pain was at times caused by changes in the position of the ureters. This obtained especially in association with movable kidney. In one case the pain disappeared after the kidney was fixed.

DR. A. J. GIBSON held that insufficient clothing was often a cause of low back pain. Sometimes girls went about with practically no clothing. The pain disappeared as soon as they were induced to wear reasonable clothes.

DR. D. S. FOY thanked Dr. Glissan and Dr. Bowker for their most instructive papers. In the out-patient department it was usually found that in the presence of inflammatory trouble the pain was sacral in origin. Low back pain in the out-patients attending the hospital usually dated from the first or from a subsequent confinment. He frequently elicited that there was more discomfort in the back during the whole of the pregnancy than usual. He assumed that the pain was due to relaxation of the sacro-iliac joints. The application of strapping in the region of the groin resulted in almost complete relief. These women were working women. The muscles and ligaments were not given rest. He applied the strapping shortly after the confinment and kept it on for six weeks. He maintained that there was no backache if there was no pelvic disorder.

Dr. Foy also dealt with pain referred to the shoulder. This occurred particularly when the pathological process affected the upper region of the abdomen.

In his reply Dr. Glissan expressed his gratification at the amount of discussion the papers had elicited. He agreed with Dr. Worrall that the conditions shown on the screen were usually irremediable in view of the anatomical nature of the spinal anomalies. On the other hand it was satisfactory to note how much alleviation of symptoms was possible by ordinary means. The American school was inclined to advise operation. The operations were usually formidable procedures. The average surgeon, unless he was perfectly sure that he could bring relief to his patient's complaints, would hesitate to adopt such bold treatment. In speaking of the palliative treatment, Dr. Glissan reminded his audience that the conditions were as a rule congenital and that they gave rise to no symptoms until some untoward factor occurred and started the pain. If they could discover this factor and remedy it, much good would follow. The factor was usually an inflammatory process or traumatic. Rest gave great relief to pain of an inflammatory origin. He did not hesitate to apply plaster of Paris, if the pain were acute and if it did not respond to ordinary remedies. He applied a

plaster spica bandage to patients with sacro-iliac pain, sciatica or painful osteoarthritis. He mentioned that osteoarthritis was not always painful. He illustrated the painlessness of severe osteoarthritis by citing the case of an elderly woman who had suffered several injuries to her knee. On examination it was found that both knees were equally affected, but the uninjured knee was not painful. He agreed with Dr. Royle about the importance of the bed in which the patient slept. He included this cause under his caption of faulty posture. He stated that anything that straightened out the lumbar curves was just as harmful as anything that tended to increase the curves. He had found the insertion of a small pillow to support the lumbar region very useful.

He was surprised to learn from Dr. Teece that muscular violence at times caused fracture of the transverse process. He had not seen it in his experience. He had encountered the fracture resulting from muscular violence only when the bone was previously affected by some morbid process. Dr. Teece's record of the radiographer's report of normal bone after the insertion of a graft was interesting. He had frequently noted that there were no radiographic signs in even severe and advanced osteoarthritis of the sacro-iliac joint. It was unwise to place much reliance on the skiagraphic evidence. He hesitated before advising Dr. Arnold what to do for the extrusion of the synovial membrane. He suggested that the condition was probably congenital. He admitted that chill was a real cause of low back pain. He maintained, however, that the actual effect of atmospheric influence on joint lesions had to be worked out. No one knew how changes of temperature, moisture and the like produced pain in defective joints, although there was no question concerning the fact.

DR. BOWKER replying to Dr. Worrall, stated that he recognized that the causes of low back pain were frequently not gynæcological and he had described the varieties to illustrate the diversity of ætiology. In his opinion osteoarthritis, particularly in older women, and renal conditions were the commonest causes when no gynæcological cause was found. Prolapse produced inconvenience and local discomfort rather than back pain. He agreed with Dr. Foy that in gynæcological cases the pain frequently dated back to a previous confinment. In regard to chill, he thought that this probably could be considered under toxic causes. What was chill? It had been ascribed to the damming back of toxins in the tissues as a result of faulty metabolism. Cold caused contraction of vessels with a lessened blood supply in the part, metabolism was interfered with and toxic products accumulated in the tissues and acted on the sensory receptors.

The Council of the British Medical Association entertained on October 12, 1927, Dr. T. P. Dunhill as a guest at its annual dinner. We understand the Council wished to show its appreciation personally to Dr. Dunhill and also to him as representative of the Branches in Australia. This is not the first occasion which the Council of the mother body has shown its appreciation of the loyalty, energy and activity of our Branches.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

Long, Robert Jeffery, M.B., B.S., 1926 (Univ. Melbourne), Canterbury.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Colvin, Clifford Stirling, M.B., Ch.M., 1926 (Univ. Sydney), Sydney Hospital.

McCann, Francis Bede, M.B., Ch.M., 1922 (Univ. Sydney), Boorowa.

Robertson, Fanny Croaker, M.B., Ch.M., 1926 (Univ. Sydney), Sofala.

Steel, Ernest McAustin, M.B., Ch.M., 1923 (Univ. Sydney), Lindfield.

Taylor, Hugh Carlyle, M.B., Ch.M., 1926 (Univ. Sydney), Scone.

Obituary.

ROBERT LEE BROWN.

ON November 3, 1927, Dr. Robert Lee Brown was travelling from Circular Quay to Watson's Bay on Sydney Harbour by the ferry *Greycliffe* and was conversing on the upper deck with a senior student of medicine, when the latter saw that disaster was imminent as the mail steamer *Tahiti* approached the ferryboat amidships. He called to his elder companion and sprang toward the stern end of the deck. Robert Lee Brown probably did not hear the warning. For a long time his body was missing, but ultimately it was found and definite evidence of his death was obtained.

Robert Lee Brown was the son of a schoolmaster. At the time of his birth on September 30, 1860, his father was the headmaster of the main school of the township in Victoria. He received his early education at his father's school. Later he matriculated and entered the University of Melbourne. He studied medicine for a time at Melbourne and then went to Scotland, where he became a medical student in Edinburgh. It appears that he interrupted his education for a time to follow the vocation of school teacher. In this way he was older than the majority of his compeers in Edinburgh. In 1893 he took the diplomas of licentiate of the Royal College of Physicians and licentiate in midwifery of the same body, as well as licentiate of the Faculty of Physicians and Surgeons of Glasgow. He then started practice at Leven, in Fifeshire, but in 1895 he turned again to the land of his birth and after a short stay in New South Wales he entered into practice at Dandenong, in Victoria. He worked up a busy and successful practice and was extremely popular in the town not only among his numerous patients, but also among the townsfolk. In 1908 he left Victoria and discovered an opening at Kensington, a suburb of Sydney. He concentrated his efforts chiefly on obstetric work and soon won the reputation of a reliable and skilful accoucheur. For over ten years he worked hard, not sparing himself in the interests of an ever increasing number of patients. His wider experience and maturer years rendered his services to his patients in Kensington even more valuable than those given to his patients in Dandenong.

While he was still at Kensington he was appointed Medical Officer to Prisons under the New South Wales Government. The duties imposed on him were those of giving the ordinary medical attendance to any prisoner at either of the Long Bay penal establishments requiring it. No prisoner needing medical or surgical attention is sent to any other prison, but is retained until the necessity for treatment no longer exists. All prisoners suffering from syphilis are compelled to undergo treatment at Long Bay until the statutory certificate of "cure" can be given. The Medical Officer of Prisons has to give evidence at trials on the condition of the prisoner's bodily and mental health. The investigation of prisoners suspected of being mentally affected is also part of his duties. In this work the medical officer has the ready assistance of the Director-General of the Insane and his staff. This constant reference to the opinion of the Director-General of the Insane naturally made his achievements as a psychiatrist very valuable in the course of time. He took a great interest in general psychology, psychiatry and criminology and his opinion was sought in very many doubtful instances. As a general practitioner he was able to carry out the great bulk of his work to the benefit of his patients and in a manner peculiarly suited to the conditions of the prison service. In due course he gave up his practice at Kensington and established himself on the southern borders of Sydney Harbour at Vaucluse. He continued to discharge his duties to the department as before.

In private life he was retiring, reticent and uncommunicative. When drawn out his conversation and reminiscences were entertaining and congenial. He was a keen sportsman. For many years he played an exceptionally good game of golf. He was practically the founder and moving spirit of the Moore Park Golf Club and was its president. He was also the president of the Kensington School of Arts. In 1894 he married Miss Ada Mary Kingsley and their family consisted of two daughters and one son who is well known in the medical profession as a rising urologist. The deep sympathy of the medical profession is extended to the members of his family.

Books Received.

ASPECTS OF RHEUMATISM AND GOUT: THEIR PATHOGENY, PREVENTION AND CONTROL, by Llewellyn Jones Llewellyn, M.B. (London); 1927. London: William Heinemann (Medical Books) Limited. Royal 8vo., pp. 310. Price 10s. net.

A TREATISE ON ORTHOPÆDIC SURGERY, by Royal Whitman, M.D., M.R.C.S., F.A.C.S.; Eighth Edition, Thoroughly Revised; 1927. Philadelphia: Lea and Febiger. Royal 8vo., pp. 1061 with illustrations. Price: $9·00 net

Diary for the Month.

DEC. 13.—Tasmanian Branch, B.M.A.: Branch.
DEC. 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
DEC. 14.—Central Northern Medical Association, New South Wales.
DEC. 16.—Queensland Branch, B.M.A.: Council.
DEC. 17.—Eastern District Medical Association, New South Wales. (Port Macquarie).
DEC. 19.—New South Wales Branch, B.M.A.: Organization and Science Committee.
DEC. 20.—Tasmanian Branch, B.M.A.: Council.
DEC. 20.—New South Wales Branch, B.M.A.: Medical Politics Committee.
DEC. 21.—Western Australian Branch, B.M.A.: Branch.

Medical Appointments.

Dr. W. C. T. Upton (B.M.A.) has been appointed Honorary Assistant Physician to the Skin Department of the Adelaide Children's Hospital, South Australia.

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Dr. James Joseph Hollywood (B.M.A.) has been appointed Government Medical Officer at West Maitland, New South Wales.

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Dr. Albert Ernest Coates (B.M.A.) and Dr. James Scott Paton (B.M.A.) have been appointed Certifying Medical Practitioners at Melbourne and Lismore respectively, under the provisions of the *Workers' Compensation Acts* of Victoria.

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Dr. Henry Rogerson (B.M.A.) has been appointed Acting Medical Superintendent of the Hospital for the Insane, Kew, Victoria.

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Dr. Charles George Thompson (B.M.A.) has been appointed a Member of the Medical Council of Tasmania.

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Dr. Samuel Roy Burston (B.M.A.) has been appointed a Member of the Nurses' Registration Board of South Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii..

BALMAIN AND DISTRICT HOSPITAL, SYDNEY: Vacancies on Honorary Staff.

LAUNCESTON PUBLIC HOSPITAL: Junior Resident Medical Officer (male).

THE RACHEL FORSTER HOSPITAL FOR WOMEN AND CHILDREN, SYDNEY: Honorary Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

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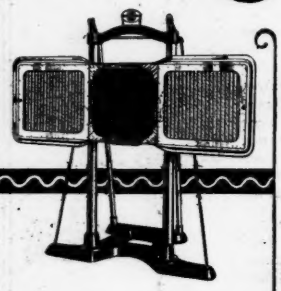

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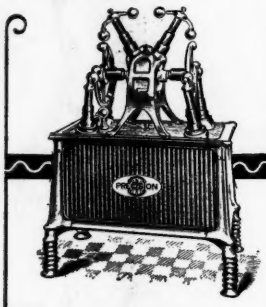

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